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INTONATIONAL STRATEGIES IN ENSEMBLE SINGING

— APPENDICES —

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MAY 2002

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APPENDIX 1

PERFORMANCE RULES

Excerpts from Sundberg, Johan, *The Science of Musical Sounds,* pp. 221-226. All Italics are from the researcher.

> "We just mentioned that a verbatim realization of the music score, faithful down to the last millisecond, does not result in a musically acceptable performance. Rather, the performance sounds machine-like (which it, of course, is!). *This shows that musicians perform music such that, for example, the durations of the tones deviate from their nominal values in the score. These deviations are often called expressive.* They are sometimes minute, sometimes great, but it seems that an attentive listener always can hear them in some sense. But first of all they are meaningful. For this reason we will call them *meaningful deviations.*
>
> Thus, these *meaningful deviations cannot be replaced by random variations*: This is not very astonishing as it really means nothing more than that musicians cannot be replaced by random functions. These meaningful deviations from the nominal description given by the score represent an important and interesting part of the science of musical sounds. And, of course, *they are far more interesting than the meaningless deviations, which occur by accident, when the musician fails to execute his or her intentions when playing.*
>
> ...
>
> It seems clear that the meaningful deviations are made according to certain principles, and at present it is difficult to see how general these principles are. However, it is obvious that a musician is by no means free to invent any principles he or she would like, because listeners would be unable to interpret new and freely invented deviations and would hence find them meaningless, i.e., a sign of poor playing technique. ...
>
> ...
>
> *The rules appear to serve two main musical purposes: differentiation of pitch and duration categories, and grouping of tones that musically belong together.*
>
> The differentiation is facilitated by enhancing the differences between categories. *For example, high notes are played somewhat sharp and low notes are played somewhat flat, thus increasing the differences between the pitch categories. At the same time, the octaves are a little stretched. Further, short notes are played a little shorter than normal and long notes a bit longer.* Another example is that the difference between dotted quarter note plus eighth note in two-fourth time, and quarter note plus eighth note in three-eighth time, is increased by taking some duration from the long note and adding it to the following shorter in three-fourths (or halves) time. Thus, in this particular durational context, the short notes are lengthened.
>
> ...
>
> *When listening to computers playing music; one almost tends to be offended by its total lack of musical understanding, and part of what is felt to be missing is the phrasing. When music is performed without consideration of the phrase structure, the result sounds overly stupid and insensitive. This suggests that we are used to hearing phrase marking in performance, apparently*

because musicians always insert them in their performances. This marking of structure occurs at different structural levels.

...

... In a similar way, Clynes advocated the assumption that *different composers must be played with composer-specific durational bar patterns.* This is probably true although not for all music. For example, many composers, particularly during the Baroque and Classic eras, often play little musical games by moving the perceived bar lines around so that they do not always match those given in the notation. Also, grouping occurs not only within but also across bars. Some rules move tones belonging together closer in time and vice versa, and this would apparently violate a rigid durational bar pattern.

...

It is also interesting to see in what way and when emphasis and its opposite deemphasis are used in music. What is it that needs emphasis? To predict this with respect to pitch classes, the old classical circle of fifths turns out to be a key. The farther away from the root of the chord a tone is located on the circle of fifths, the more emphasis it appears to need in the performance....

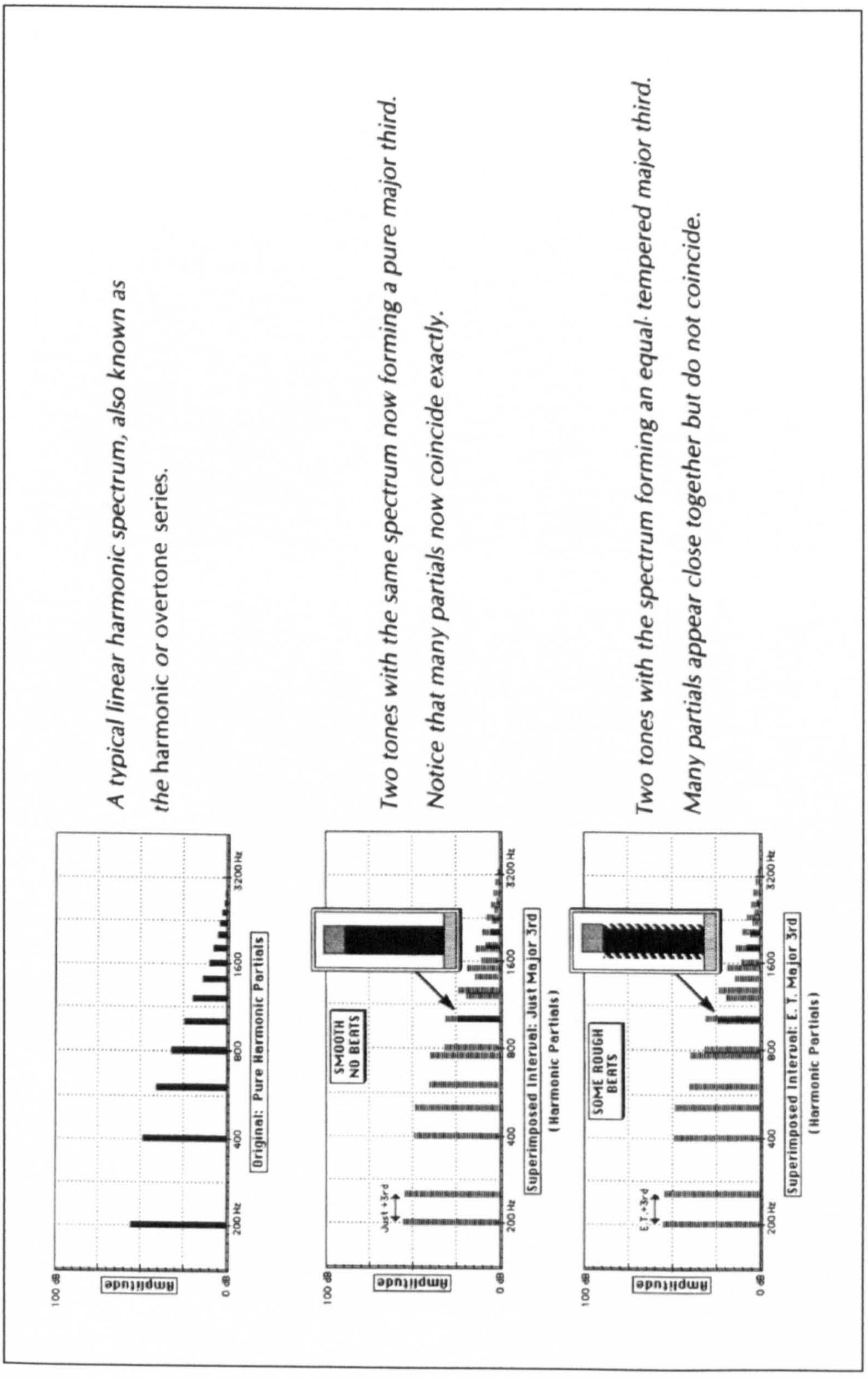
A melodically charged note is lengthened and is played louder and, if possible, with more vibrato.

...

...

Phrase endings are marked by a lengthening of the final tone or tones, and subphrase endings are marked by micropauses. This is, in fact, exactly the same code as is used in speech! In sentences the last syllables are lengthened, and small pauses are inserted after smaller groups of words. Also with respect to emphasis marking, there are strong parallels with speech. Important events are lengthened in both cases. *In music not much can be done with pitch, but the depth of the vibrato modulation can be increased, provided the instrument allows it.*

APPENDIX 2
HARMONIC SPECTRA



2 - HARMONIC SPECTRA

APPENDIX 3

IMAGES OF THE EXPERIMENTAL WORK

3 - Images of the Experimental Work



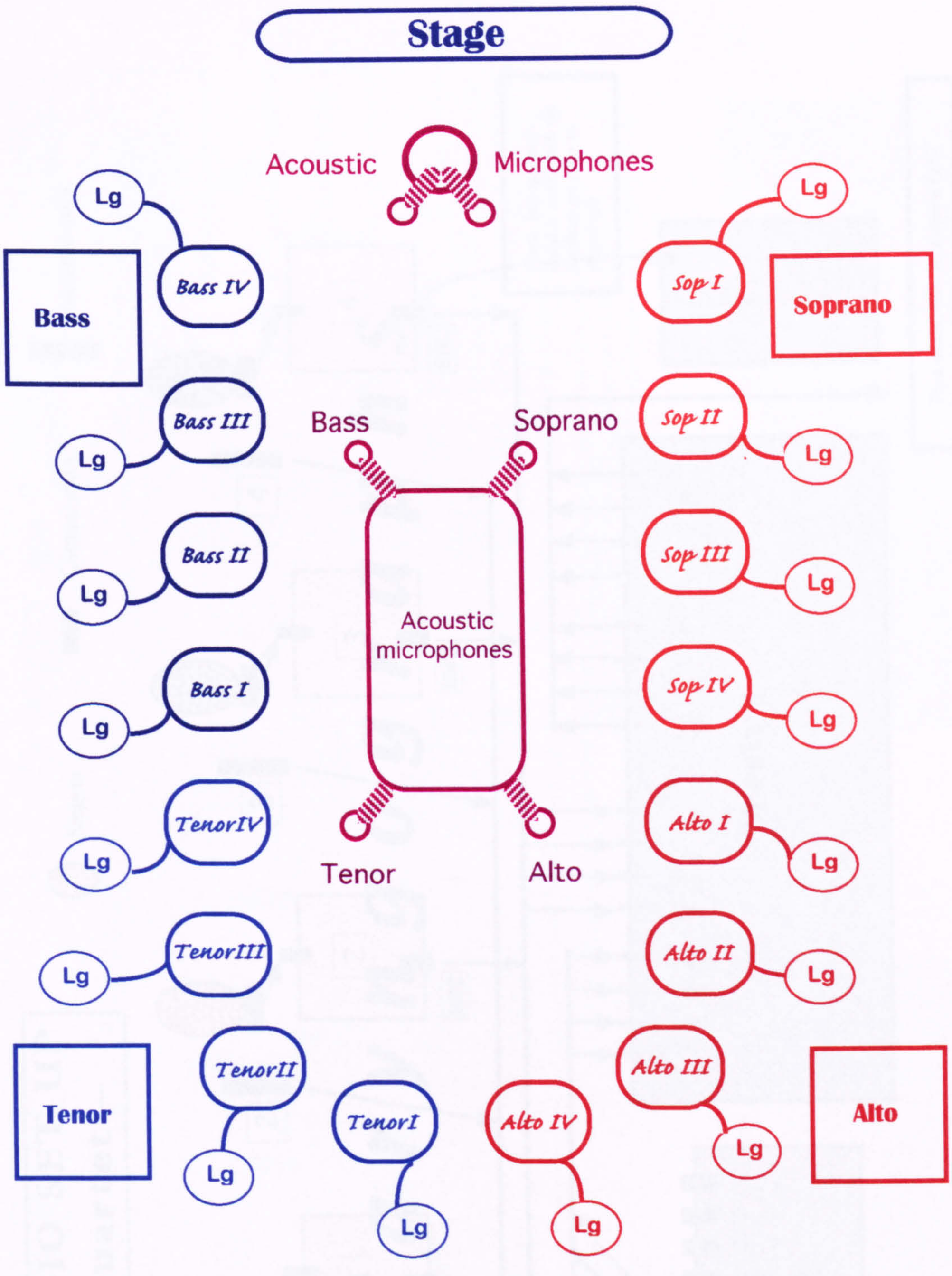

24 4'97

3 - IMAGES OF THE EXPERIMENTAL WORK

APPENDIX 4

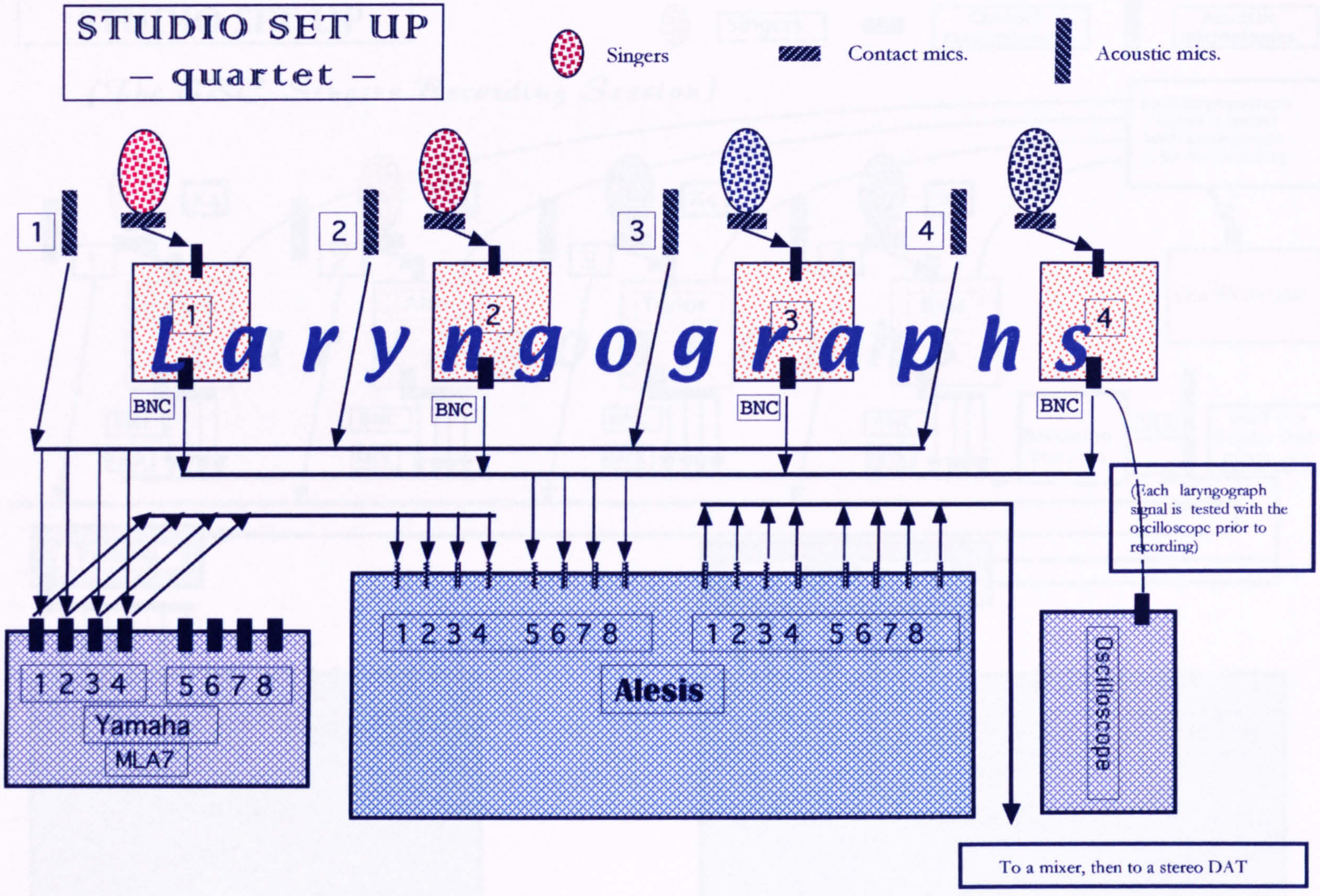
RECORDING SESSIONS DIAGRAMS

4 - Recording Sessions' Diagrams



THE BBC SINGERS' DISPOSITION DIAGRAM

4.1 – CHOIR'S DISPOSITION

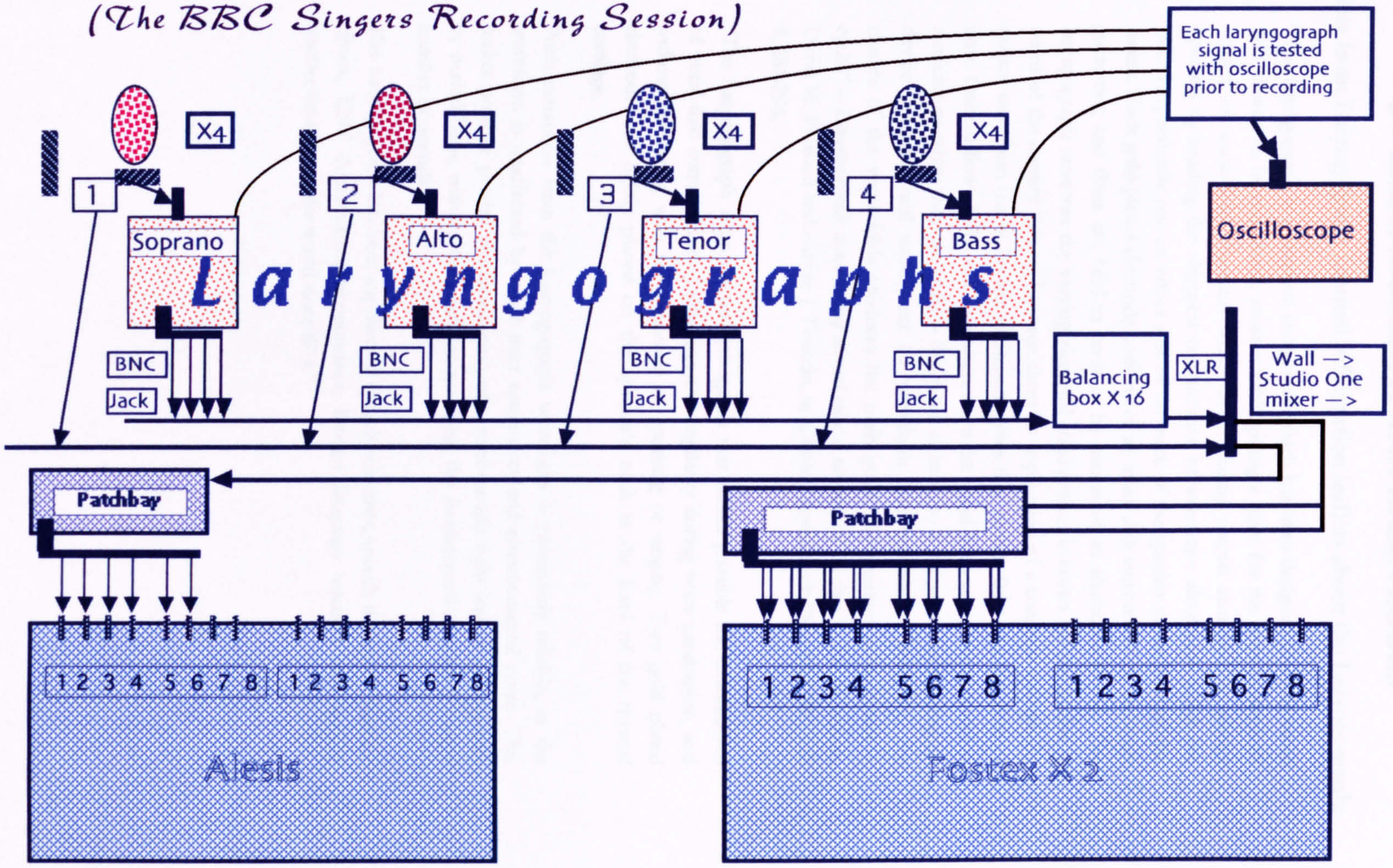

STUDIO SET UP
– quartet –
Singers
Contact mics.
Acoustic mics.
1
2
3
4
Laryngographs
BNC
BNC
BNC
BNC
(Each laryngograph signal is tested with the oscilloscope prior to recording)
1 2 3 4 5 6 7 8
Yamaha
MLA7
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
Alesis
Oscilloscope
To a mixer, then to a stereo DAT

4.2 - QUARTET'S STUDIO SETUP

STUDIO SET UP

Singers | Contact microphones | Acoustic microphones

(The BBC Singers Recording Session)



4.3 - Choir's Studio Setup

APPENDIX 5

5 - LARYNGOGRAPH AND ELECTRODES

Extracts from Laryngograph Limited information leaflets about the Laryngograph:

"The laryngograph is a practical instrument which has been designed to allow vocal fold closure to be monitored, most notably giving a basis for the measurement of aspects of vocal fold vibration which occur during voiced sounds. The device operates by sending the electrical conductance between two electrodes which are placed superficially one on either side of the neck of the speaker at the level of the larynx. Each gold-plated electrode consists of an inner disk surrounded by an outer guard-ring and these are held in position by means of an elastic neckband. The laryngograph monitors the varying electrical conductance between the electrodes in terms of the current flowing between them on application of a constant voltage. Its output waveform (Lx = Larynx excitation) gives this current flow as a function of time. Current flow will be at a maximum when the vocal folds are in contact, and at a minimum when they are apart – this point is basic to a proper understanding of device operation and subsequent Lx waveform interpretation. Acoustically, the closure of the vocal folds produces the main pulse of excitation in each larynx cycle." – *Laryngographic assessment of normal voice: a tutorial*, by Evelyn R. M. Abberton, David M. Howard and Adrian J. Fourcin, in *Clinical Linguistics & Phonetics*, 1989, vol. 3, 281-296.

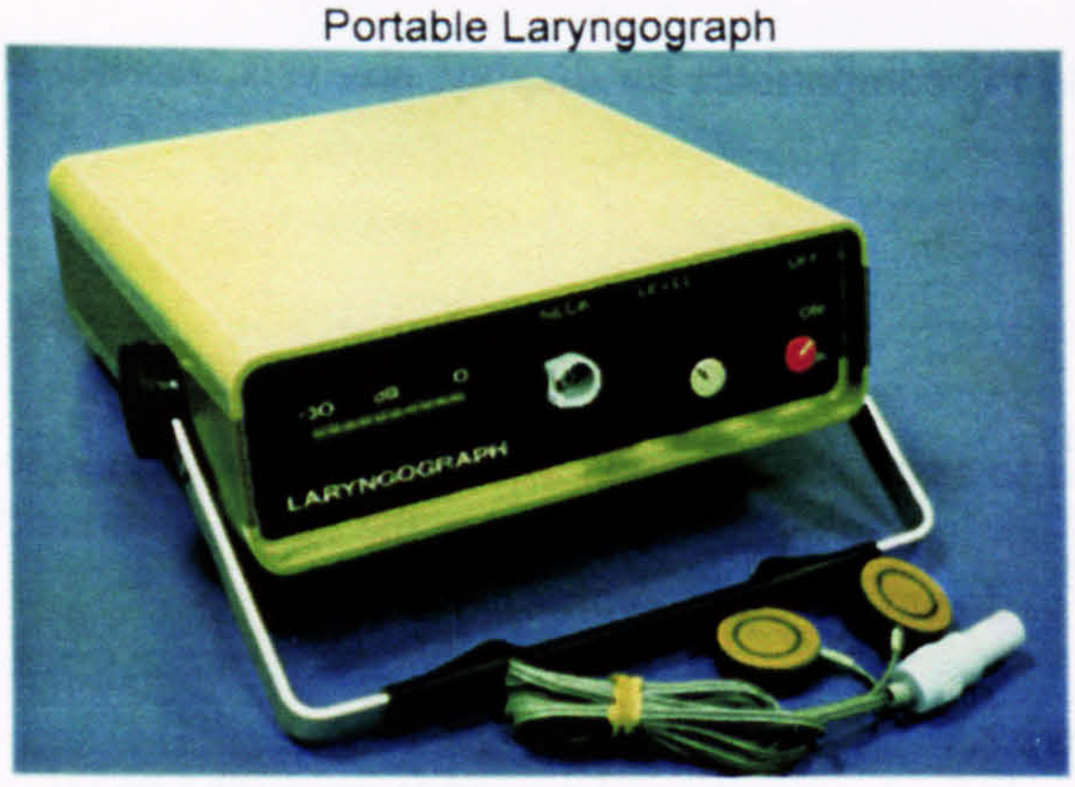
"The Laryngograph is an electro-glottograph that makes possible the examination of vocal-fold contact, rate of vibration and regularity during voice production, and without interfering with the processes of speaking or singing. Two gold plated electrodes are lightly placed on the speaker's neck at the level of the thyroid cartilage.

Pitch extraction from the Laryngograph waveform is particularly reliable, as the waveform is unaffected by vocal tract resonances and environmental noise. This makes possible precise synchronisation of a stroboscopic light source on a period by period basis, without the need for averaging the fundamental frequency over a number of periods.

The Laryngograph has been supplied to speech scientists, speech therapists, hearing clinics, ENT departments, phoneticians, foreign language teachers and singing teacher throughout the world since 1974."

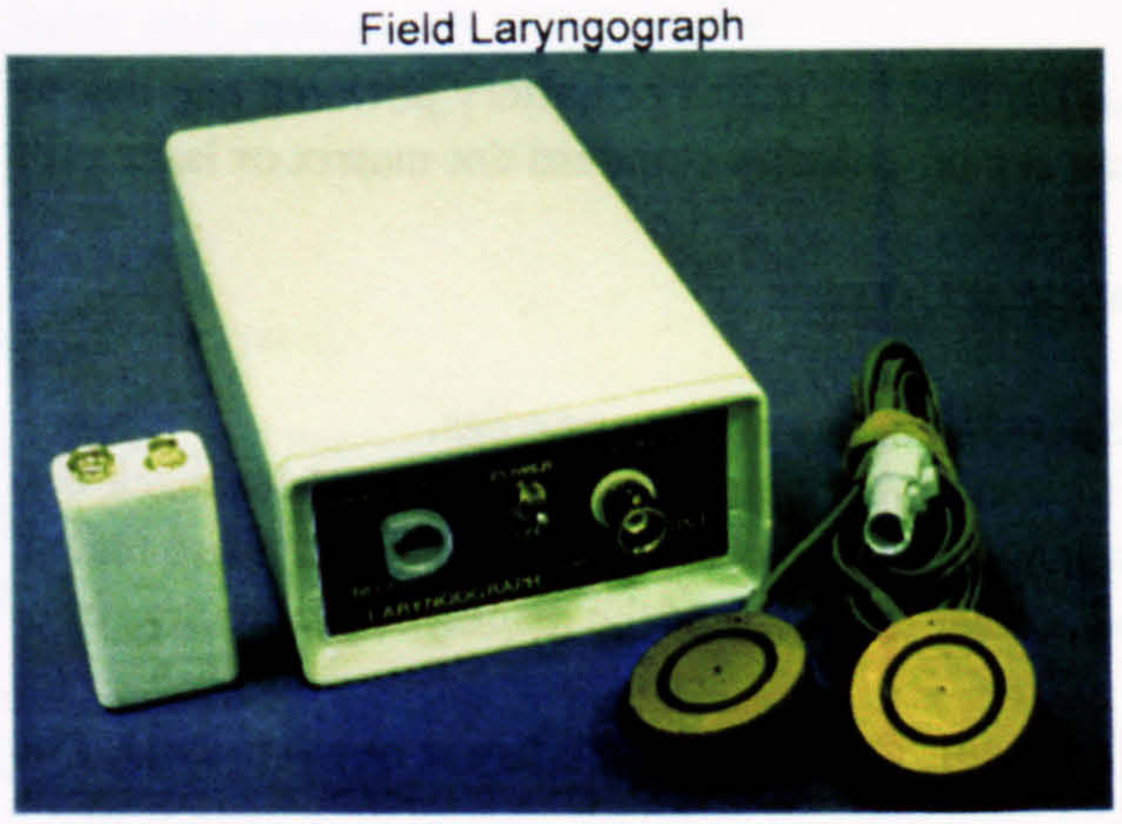
Laryngographs

Portable Laryngograph



22x23x7cm. 1.4Kg. Battery/mains operation

Field Laryngograph



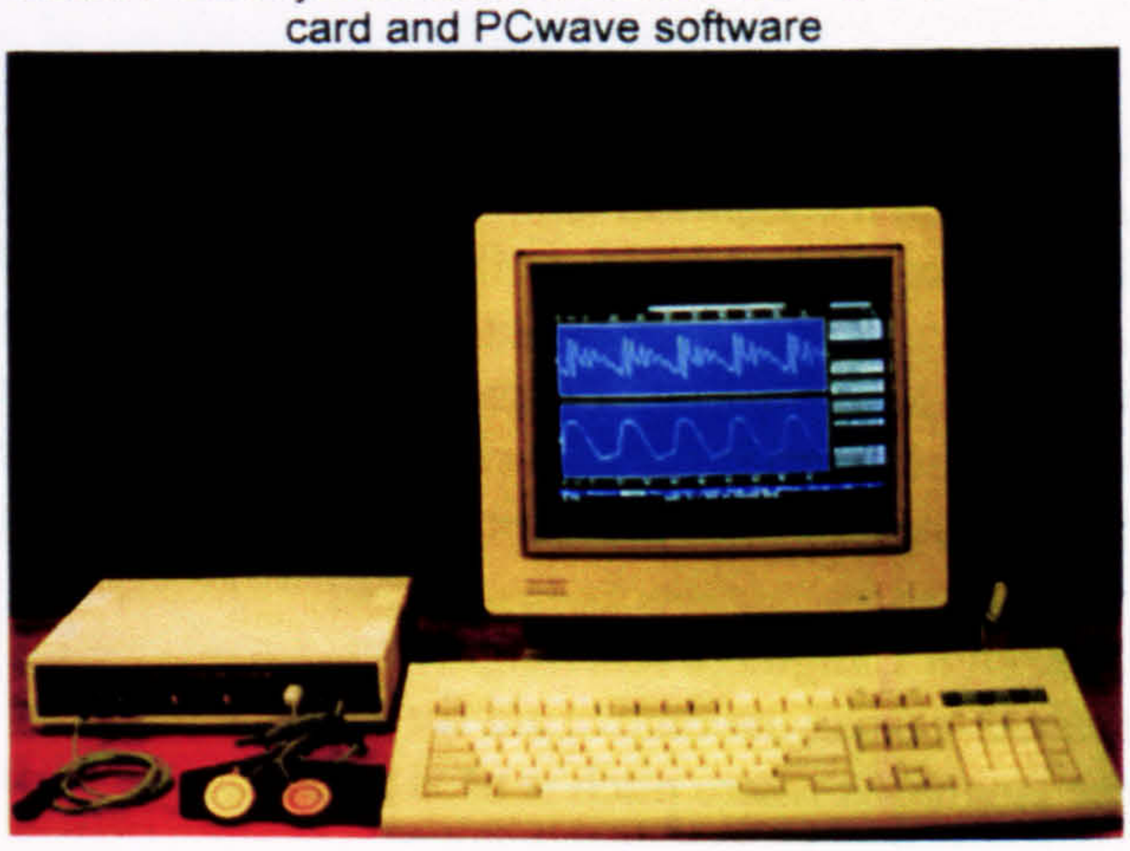
9.5x16x4.5cm. 500gm. Battery only operation.

Speech and Laryngograph systems

Laryngograph Processor (PCLX) with PCLX DSP card, microphone and assorted electrodes



Basic PCLX system with Lx Processor, PC with PCLX card and PCwave software



Laryngograph Ltd
1 Foundry Mews, London NW1 2PE, U.K.
Tel: +44.(0)171.387 7793
Fax: +44.(0)171.383.2039

5 - LARYNGOGRAPH AND ELECTRODES

APPENDIX 6

6.1 - SOUNDSCOPE INSTRUMENTS

Some extracts from the SoundScope User's manual are presented to describe the basic functions and building blocks of the software.

> "SoundScope was created to help you record, analyze, manipulate, and play speech and other sounds. Both recorded sounds and the sound calculations are stored in the computer as **waves**. Specific time values in a wave may be indicated by **markers** that can be moved with the mouse. The waves and markers are shown on the screen in rectangular areas called **displays**. The number, size, type and layout of displays is completely controlled by the user. There are four types of displays, listed below.
>
> **Wave Plot** shows the timewave (voltage as a function of time).
>
> **Analysis** shows a Spectrogram, LPC History, Horizontal Spectral Slice, Long-term Average Spectrum, To (fundamental frequency), Jitter, Shimmer, HNR (Harmonic-to-noise ratio), Envelope, Energy, Zero Crossing rate, Spline, or LPC Residual.
>
> **Snapshots** shows a close-up of the timewave at a specific point in time, showing either a 10, 20, 50 or 100 msec window, or an "instantaneous" FFT (Fast Fourier Transform), LPC (Linear Predictive Coding) or Cepstrum.
>
> **XY Plot** shows a wave plotted against another wave (e.g. F1 vs. F2), rather than as a function of time
>
> SoundScope also features integrated text editors called **journals**...
>
> Waves, markers, displays, and journals can be combined like building blocks to create software **instruments**. A few pre-defined instruments have been included with SoundScope. You can use these as is, customize them to suit your specific needs, or build new instrument from scratch." (Pages 2-1 to 2-2)

6.2 - SOUNDSCOPE OBJECTS

The SoundScope objects are:

- Waves – they are used to represent real world continuous data as a list of values, which when plotted, produce a waveform. Their values (voltage as a function of time) can be accessed and edited in a spreadsheet-like environment. Waves can also be manipulated in many ways.
- Displays – used to view waveforms and perform calculations. Each display con contain up to 8 waves. There are four display types: Wave plot, XY plot, Analysis and Snapshot.
- Markers – are used to mark a time in a wave or display. A pair of markers may define a segment of a wave. A wave may contain as many markers as necessary.
- Journals – are text regions that are used to enter, view and edit text in a similar way it is done in a word processor. It can operate in one of two modes: word processor or spreadsheet.
- Menubars – they can be redefined at will.
- Instructions – are the building blocks used to create tasks. There are over twenty kinds of instructions, each of which is used to perform a specific function.
- Tasks – Little program sequences that perform a series of operations when run, like it happens with macros in other programs. The tasks are built with *instructions*.
- Strings – they hold a series of characters of any length
- Variables – are used to hold one 32-bit floating-point value.

6.3 - FUNDAMENTAL FREQUENCY (F_0)

"Fundamental frequency (Fo) corresponds to the rate of the speaker's vocal cord vibration. This vibration appears as a periodic component in a speech waveform whose frequency varies over time. Naturally, the fundamental frequency can only be evaluated during voiced intervals. Fundamental frequency is determined using either an auto-correlation technique or a peak-picking algorithm, as specified in the Fo Setup dialog box.

...The peak-picking algorithm identifies the individual cycles in the source wave in order to calculate the fundamental frequency. The technique used is described in Gold, "Computer Program for Pitch Extraction." JASA, 34(7)[1]. The peak-picking algorithm produces a sequence of pitch values, one value for each pitch period. Variations in pitch cause this sequence of numbers to be spaced somewhat irregularly in time.

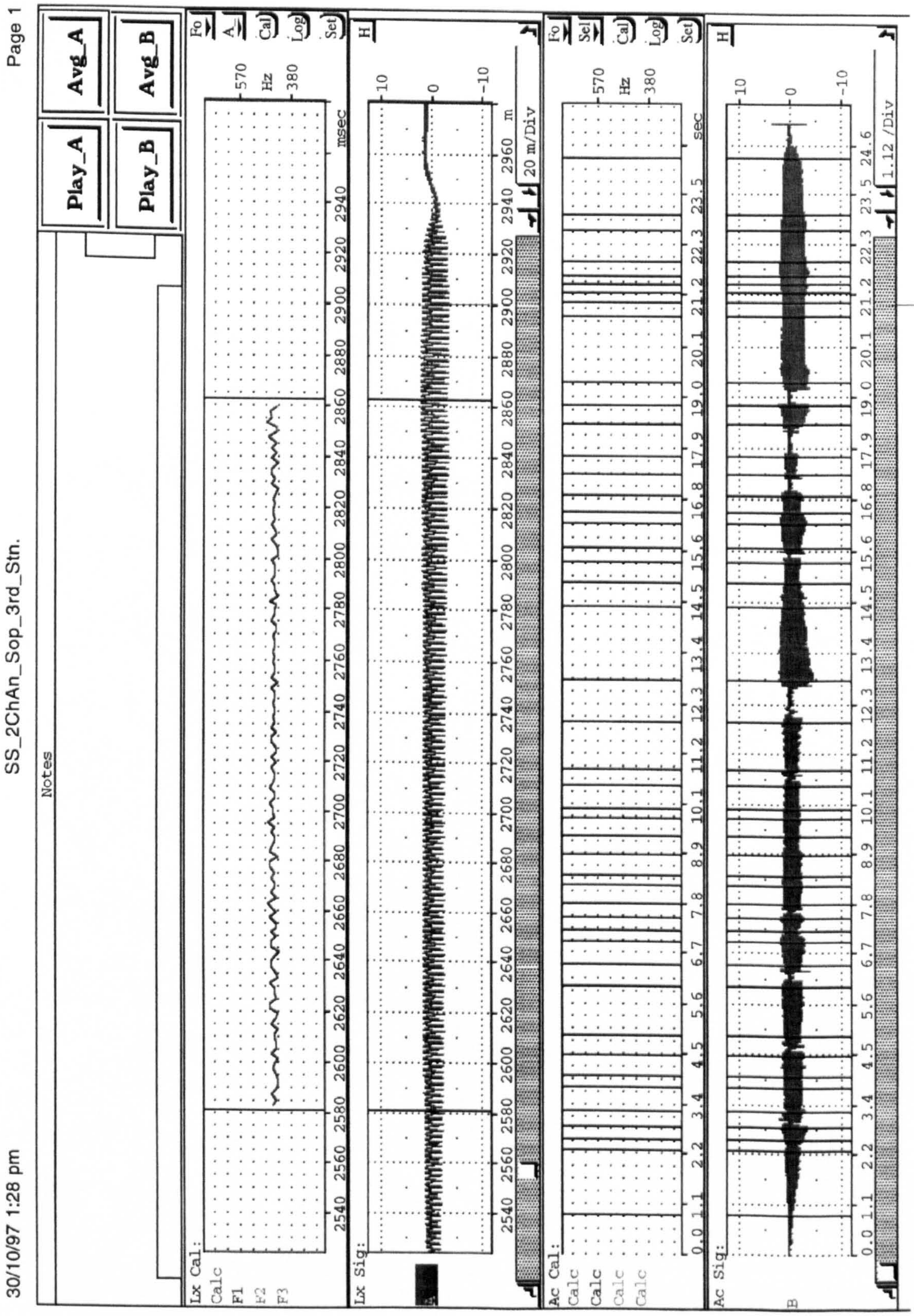
Both pitch-tracking techniques limit their search for pitch values to the pitch range specified in the Fo Options dialog. Gaps appear in the Fo plot in those regions in the source wave where no pitch has been detected in the pitch range." (Pages A-8 to A-9)

---

[1] The correct reference is:
GOLD, B. (1962). Computer program for pitch extraction. *Journal of the Acoustical Society of America* 34: 916-921.

6.3 – FUNDAMENTAL FREQUENCY

6.4 - SOUNDSCOPE SAMPLE
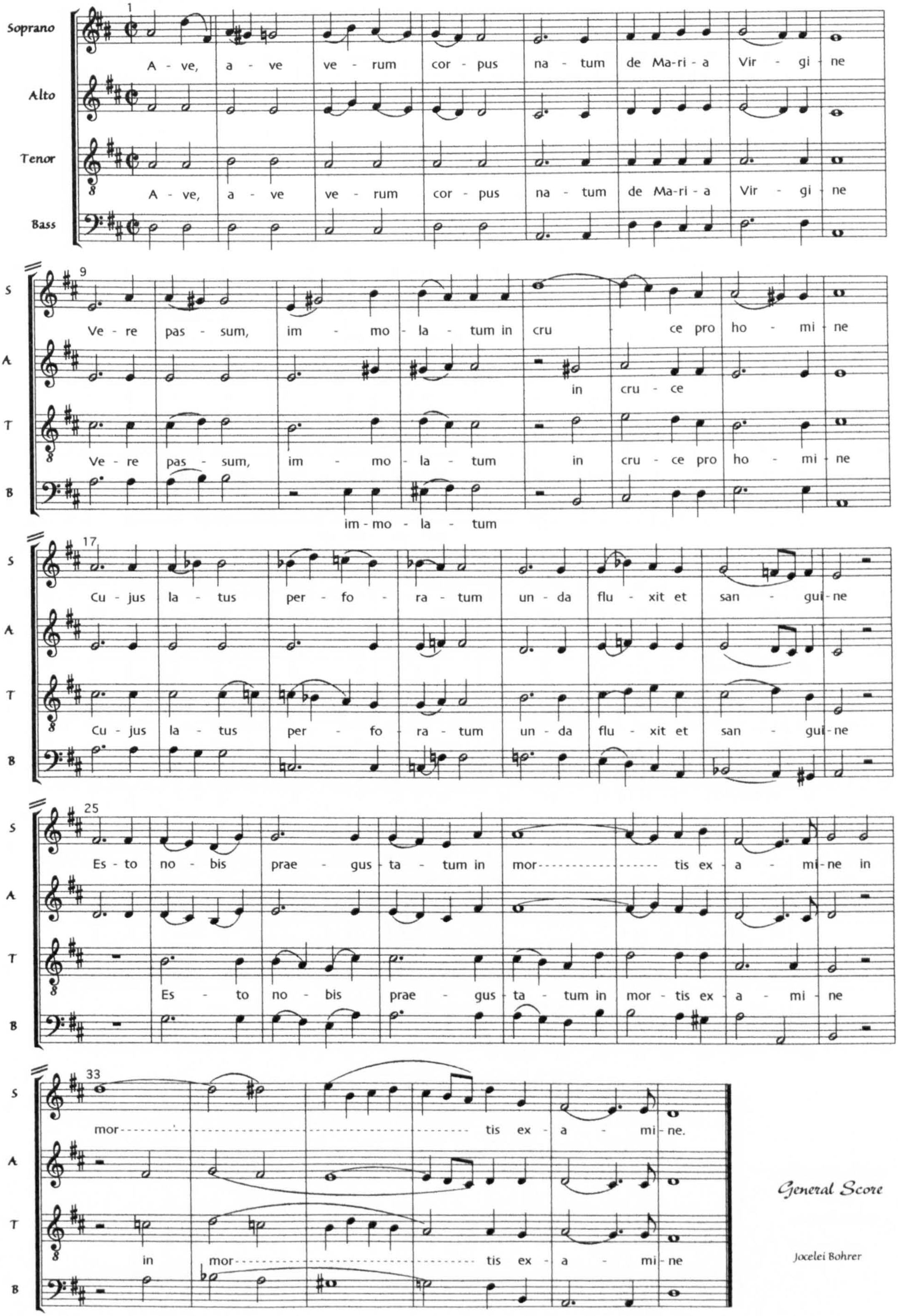


6.4 - SOUNDSCOPE SAMPLE

APPENDIX 7

7 - SCORES

Ave Verum Corpus

W. A. Mozart



General Score

Jocelei Bohrer

7.1 – GENERAL SCORE

Ave Verum Corpus

W. A. Mozart

Soprano: A - ve, a - ve ve- rum cor- pus na - tum de Ma-ri-a Vir - gi - ne

Alto: A - ve, a - ve ve - rum cor - pus na - tum de Ma-ri-a Vir - gi - ne

Tenor: A - ve, a - ve ve - rum cor - pus na - tum de Ma-ri-a Vir - gi - ne

Bass

S: Ve - re pas - sum, im - mo - la- tum in cru - ce pro ho - mi - ne

A: Ve - re pas - sum, im - mo - la - tum in cru - ce pro ho - mi - ne

T: Ve - re pas - sum, im - mo - la - tum in cru - ce pro ho - mi - ne

B: im - mo - la - tum

S: Cu - jus la - tus per - fo - ra - tum un - da flu - xit et san - gui - ne

A: Cu - jus la - tus per - fo - ra - tum un - da flu - xit et san - gui - ne

T: Cu - jus la - tus per - fo - ra - tum un - da flu - xit et san - gui - ne

B

S: Es - to no - bis prae - gus - ta - tum in mor - - - - - tis ex - a - mi - ne in

A: Es - to no - bis prae - gus - ta - tum in mor - - - - - tis ex - a - mi - ne in

T: Es - to no - bis prae - gus - ta - tum in mor - tis ex - a - mi - ne

B: Es - to no - bis prae - gus - ta - tum in mor - tis ex - a - mi - ne

S: mor - - - - -

7.2 – General numbered score

Ave Verum Corpus

W. A. Mozart

Soprano: A- ve, a- ve ve- rum cor- pus na- tum de Ma-ri- a Vir- gi- ne

Alto: A- ve, a- ve ve- rum cor- pus na- tum de Ma-ri- a Vir- gi- ne

Tenor: A - ve, a - ve ve - rum cor - pus na - tum de Ma-ri - a Vir - gi - ne

Bass: im- mo- la- tum

S: Ve - re pas - sum, im - mo - la - tum in cru - ce pro ho - mi - ne

A: Ve - re pas - sum, im - mo - la - tum in cru - ce pro ho - mi - ne

T: Ve - re pas - sum, im - mo - la - tum in cru - ce pro ho - mi - ne

B: im- mo- la- tum

S: Cu - jus la - tus per - fo - ra - tum un - da flu - xit et san - gui - ne

A: Cu - jus la - tus per - fo - ra - tum un - da flu - xit et san - gui - ne

T: Cu - jus la - tus per - fo - ra - tum un - da flu - xit et san - gui - ne

B:

S: Es - to no - bis prae - gus - ta - tum in mor - - - - - - - - - - - - tis ex - a - mi - ne in

A: Es - to no - bis prae - gus - ta - tum in mor - - - - - - - - - - - - tis ex - a - mi - ne in

T: Es - to no - bis prae - gus - ta - tum in mor - tis ex - a - mi - ne
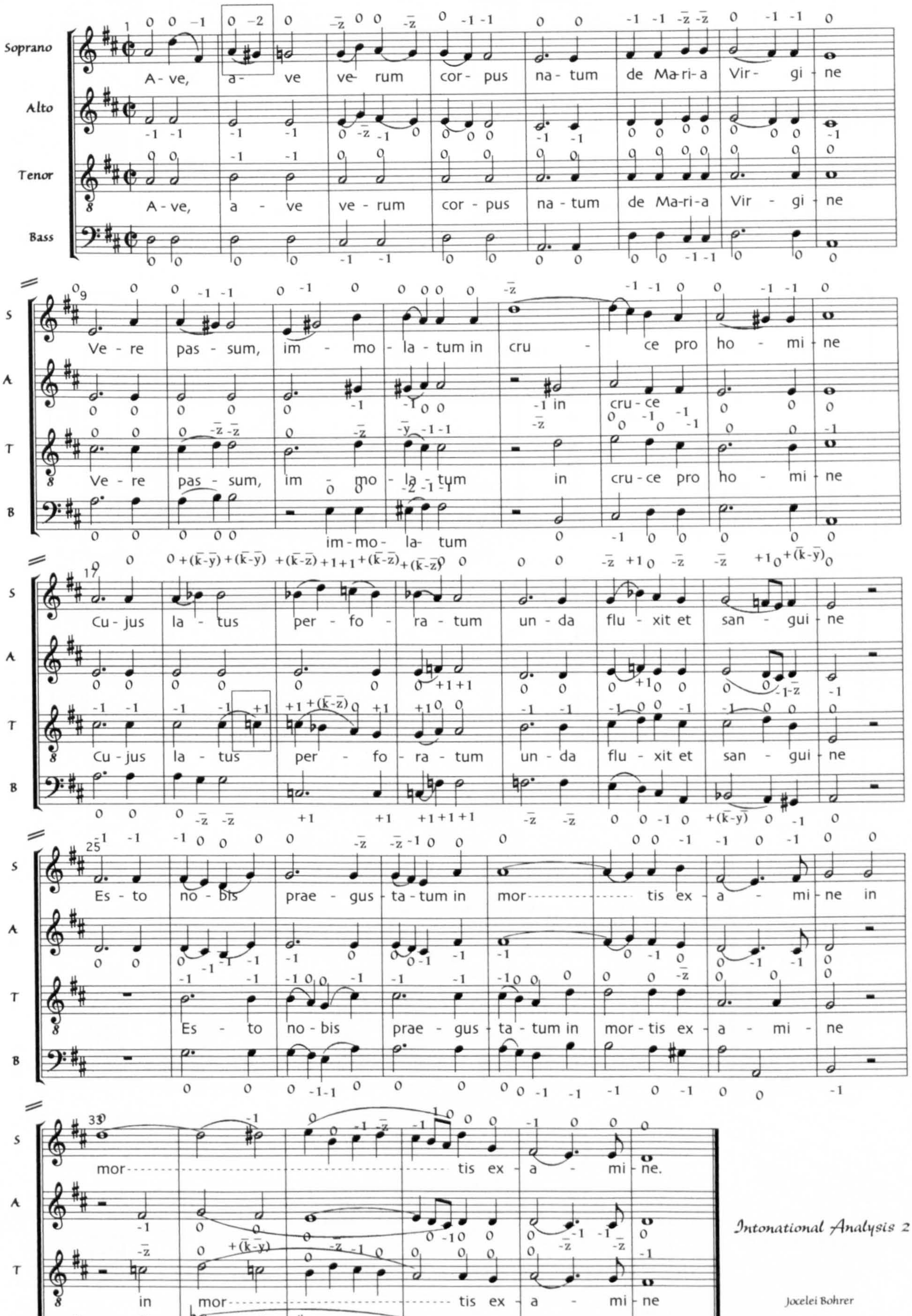
B:

S: mor - - - - - - - - - - - -

7.3 – Extended Intonation analysis I score

Ave Verum Corpus

W. A. Mozart



Intonational Analysis 2

Jocelei Bohrer

7.4 – Extended Intonation analysis II score

Ave Verum Corpus

W. A. Mozart

Soprano: A - ve, a - ve ve - rum cor - pus na - tum de Ma-ri - a Vir - gi - ne

Alto: D3

Tenor: A - ve a - ve ve - rum cor - pus na - tum de Ma-ri - a Vir - gi - ne

Baixo:

S: Ve - re pas - sum im - mo - la - tum in cru - ce pro ho - mi - ne

A: A2 in cru - ce

T: A2 Ve - re pas - sum im - mo - la - tum in cru - ce pro ho - mi - ne

B: im - mo - la - tum

S: Cu - jus la - tus per - fo - ra - tum un - da flu - xit et san - gui - ne

A: A2

T: A2 Cu - jus la - tus per - fo - ra - tum un - da flu - xit et san - gui - ne

B:

S: Es - to no - bis prae - gus - ta - tum in mor - - - - - - - - - - - - - - - tis ex - a - mi - ne in

A:

T: D3 Es - to no - bis prae - gus - ta - tum in mor - tis ex - a - mi - ne

B:

S: mor - - - - - - - - - - - - - - -

7.5 – REFERENCE FREQUENCIES SCORE

Ave Verum Corpus

W. A. Mozart

Soprano: A - ve, a - ve ve- rum cor- pus na - tum de Ma-ri-a Vir - gi - ne

Alto: A - ve, a - ve ve - rum cor - pus na - tum de Ma-ri-a Vir - gi - ne

Tenor: A - ve, a - ve ve - rum cor - pus na - tum de Ma-ri-a Vir - gi - ne

Bass

S: Ve - re pas - sum, im - mo - la- tum in cru - ce pro ho - mi - ne

A: in cru - ce

T: Ve - re pas - sum, im - mo - la- tum in cru - ce pro ho - mi - ne

B: im - mo - la- tum

S: Cu - jus la - tus per- fo - ra- tum un - da flu - xit et san - gui - ne

A

T: Cu - jus la - tus per- fo - ra- tum un - da flu - xit et san - gui - ne

B

S: Es - to no- bis prae - gus - ta- tum in mor - - - - - - - - - - - - - - - tis ex - a - mi - ne in

A

T: Es - to no- bis prae - gus - ta- tum in mor - tis ex - a - mi - ne

B

S: mor - - - - - - - - - - - - - - -

7.6 – TARGET NOTES SCORE

APPENDIX 8

8 - TUNING TABLES – ANALYSES

Cents Table for Extended Pythagorean and Just Intonations, plus Extended Meantone Temperament

Degree	Ext Pyth Intonation	Extended JI +1 sc	Ext Just Intonation	Extended JI -1 sc	Extended JI -2 sc	Extended JI -3 sc	Extended JI -z	Extended JI -(k+z)	Extended JI - y	Extended JI +(k-y)	Extended MT Temp	Degree
I	261.626	21.506	264.000	-21.506	-43.013	-64.519	-27.264	-48.771	-6.775	14.731	264.000	I
I #	113.685	135.191	113.685	92.180	70.673	49.167	86.422	64.915	106.910	128.415	76.049	I #
I x	227.371	248.876	227.371	205.863	184.358	162.851	200.106	178.599	220.594	242.105	152.098	I x
II bb	-23.460	-1.954	-23.460	-44.966	-66.473	-87.979	-50.724	-72.230	-30.236	-8.729	41.059	II bb
II b	90.225	111.732	90.225	68.719	47.212	25.706	62.961	41.454	83.450	104.955	117.107	II b
II	203.910	225.417	203.910	182.404	160.898	139.392	176.646	155.140	197.133	218.640	193.157	II
II #	317.595	339.101	317.595	296.088	274.582	253.076	290.331	268.825	310.819	332.325	269.206	II #
II x	431.280	452.786	431.280	409.774	388.267	366.761	404.016	382.509	424.504	446.010	345.255	II x
III bb	180.450	201.956	180.450	158.944	137.437	115.930	153.185	131.680	173.675	195.181	234.216	III bb
III b	294.135	315.641	294.135	272.628	251.122	229.616	266.871	245.364	287.360	308.866	310.265	III b
III	407.820	429.326	407.820	386.314	364.808	343.301	380.556	359.050	401.044	422.551	386.314	III
III #	521.505	543.011	521.505	499.999	478.492	456.986	494.241	472.735	514.729	536.235	462.362	III #
IV b	384.360	405.867	384.360	362.853	341.347	319.842	357.096	335.589	377.584	399.090	427.373	IV b
IV	498.045	519.551	498.045	476.538	455.033	433.526	470.781	449.274	491.269	512.776	503.422	IV
IV #	611.730	633.236	611.730	590.224	568.718	547.211	584.466	562.959	604.954	626.461	579.470	IV #
IV x	725.415	746.922	725.415	703.909	682.402	660.896	698.151	676.645	718.640	740.145	655.520	IV x
V bb	474.585	496.091	474.585	453.079	431.572	410.066	447.321	425.815	467.809	489.315	544.480	V bb
V b	588.270	609.776	588.270	566.763	545.257	523.751	561.006	539.499	581.494	603.001	620.530	V b
V	701.955	723.461	701.955	680.448	658.943	637.436	674.691	653.184	695.180	716.685	696.579	V
V #	815.640	837.146	815.640	794.133	772.627	751.121	788.375	766.870	808.865	830.370	772.627	V #
V x	929.325	950.832	929.325	907.818	886.313	864.806	902.061	880.554	922.549	944.055	848.677	V x
VI bb	678.496	700.001	678.496	656.988	635.483	613.977	651.231	629.725	671.719	693.225	737.637	VI bb
VI b	792.180	813.686	792.180	770.674	749.167	727.661	764.916	743.409	785.404	806.910	813.686	VI b
VI	905.865	927.372	905.865	884.359	862.853	841.346	878.601	857.095	899.089	920.596	889.736	VI
VI #	1019.550	1041.056	1019.550	998.044	976.538	955.031	992.286	970.780	1012.774	1034.281	965.784	VI #
VI x	1133.235	1154.742	1133.235	1111.729	1090.222	1068.716	1105.971	1084.465	1126.459	1147.966	1041.833	VI x
VII bb	882.405	903.912	882.405	860.899	839.393	817.886	855.141	833.635	875.629	897.135	930.794	VII bb
VII b	996.090	1017.596	996.090	974.584	953.077	931.571	968.826	947.320	989.314	1010.821	1006.843	VII b
VII	1109.775	1131.281	1109.775	1088.269	1066.763	1045.256	1082.511	1061.005	1102.999	1124.506	1082.892	VII
VII #	1223.460	1244.967	1223.460	1201.953	1180.447	1158.941	1196.196	1174.690	1216.685	1238.191	1158.941	VII #
VIII b	1086.315	1107.821	1086.315	1064.809	1043.303	1021.796	1059.051	1037.545	1079.539	1101.046	1123.951	VIII b

Note:The first degree frequency values (in bold characters) are given as examples only, since in this table they will provide always the same results in cents.

8.1 – EXTENDED INTONATION TABLES

Ave Verum Corpus_Tuning Table — Extended Just Intonation Analysis I

Difference in Cents from Equal Temperament

Phrases

First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
A4	1.955	F#4	-13.686	A3	1.955	D3	0.000	E4	3.911	E4	3.911	C#4	-11.731	A3	1.955	A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	F#4	-35.192	D4	-21.506					G4	-23.461						
D5	0.000	F#4	-13.686	A3	1.955	D3	0.000	A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	F#4	-35.192	D4	-21.506					D5	-21.506						
F#4	-13.686							A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	F#4	-35.192	D4	-21.506	B3	-37.147	G3	-23.461			F#4	-35.192	C4	-52.680	A3	-19.551
A4	1.955	E4	-17.596	B3	-15.641	D3	0.000	G#4	-9.776			D4	-27.264	B3	5.865	Bb4	6.911					G3	-11.623	E4	-17.596	C#4	-33.237							G4	-23.461	D4	-21.506	Bb3	-7.820
G#4	-31.282							G#4	-9.776	E4	3.911	D4	-27.264	B3	5.865	Bb4	6.911	E4	3.911	C#4	-11.731	G3	-11.623	D4	-21.506	B3	-37.147					D#5	-29.326	F#4	-13.686	C4	-10.685	A3	-46.814
G4	-1.955	E4	-17.596	B3	-15.641	D3	0.000	E4	3.911	E4	3.911	B3	5.865							C4	-3.910			G4	-23.461	E4	-39.102	B3	-37.147	G3	-23.461	E5	-17.596	E4	-17.596	B3	-15.641	G#3	-31.282
G4	-29.219	E4	3.910	A3	1.955	C#3	-11.731	G#4	-9.776							Bb4	-35.084	E4	-17.596	C4	-3.910	C3	-3.910	G4	-23.461	E4	-39.102	B3	-37.147	G3	-23.461	B4	-15.641			D4	-48.770		
B4	5.865	G4	-29.219											E3	3.911	D5	0.000			Bb3	-35.084							A3	-19.551	F#3	-35.192	C#5	-33.237			C#4	-33.237		
A4	1.955	F#4	-13.686	A3	1.955	C#3	-11.731	B4	5.865	G#4	-9.776	D4	-27.264	E3	3.911	C5	-3.910			A3	-19.551							G3	-23.461	E3	-39.102	D5	-48.770			B3	-15.641		
G4	-29.219	E4	3.910					B4	-42.905	G#4	-9.776	D4	-6.775	E#3	-25.417	Bb4	-35.084	E4	-17.596	G3	-1.954	C3	-3.910	G4	-50.725	E4	-17.596	C#4	-33.237	A3	-19.551	C#5	-33.237			A3	-19.551	G3	-50.725
G4	-1.955	E4	3.910	A3	1.955	D3	0.000	A4	1.955	A4	1.955	C#4	-11.731	F#3	-13.686	Bb4	-35.084	E4	-17.596	G3	-1.954	C3	-3.910	G4	-50.725	E4	-17.596	C#4	-33.237	A3	-19.551	B4	-37.147	D4	-21.506			
F#4	-13.686	D4	0.000					A4	1.955	A4	1.955	C#4	-11.731	F#3	-13.686	A4	-19.551	F4	-5.864	A3	-19.551	F3	-5.864	F#4	-35.192	D4	-21.506					A4	-19.551	C#4	-33.237				
F#4	-13.686	D4	0.000	A3	1.955	D3	0.000	A4	1.955							A4	-19.551	F4	-5.864	A3	-19.551	F3	-5.864	E4	-17.596	C#4	-33.237					D5	-21.506	D4	-21.506	A3	-19.551	F#3	-35.192
E4	3.910	C#4	-11.731	A3	1.955	A2	1.955	D5	-27.264							G4	-23.460	D4	-21.506	B3	-37.147	F3	-54.634	A4	-19.551	F#4	-35.192	C#4	-33.237	A3	-19.551	G4	-23.461	D4	-21.506	G3	-23.461	B2	-37.147
E4	3.910	C#4	-11.731	A3	1.955	A2	1.955			G#4	-9.776	D4	-27.264	B2	5.865	G4	-23.460	D4	-21.506	B3	-37.147	F3	-54.634	A4	-19.551	F#4	-35.192	C#4	-33.237	A3	-19.551	F#4	-35.192	D4	-21.506	A3	-19.551	A2	-19.551
F#4	-13.686	D4	0.000	A3	1.955	D3	0.000			A4	1.955	E4	3.911	C#3	-11.731	G4	-50.725	E4	-17.595	C#4	-33.237	E3	-17.595					B3	-37.147	G3	-23.461	E4	-17.596	C#4	-33.237	G3	-50.725		
F#4	-13.686	D4	0.000	A3	1.955	D3	0.000	C#4	-11.731							Bb4	-7.819	F4	-5.864	D4	-21.506	D3	-21.506					A3	-19.551	F#3	-35.192							A2	-19.551
G4	-29.219	E4	3.910	A3	1.955	C#3	-11.731	B4	-15.641	F#4	-13.686	D4	0.000	D3	0.000	A4	-19.551	E4	-17.595	E4	-17.595	C#3	-33.237					D4	-21.506	B3	-37.147	E4	-17.596	C#4	-33.237	G3	-50.725		
G4	-29.219	E4	3.910	A3	1.955	C#3	-11.731	A4	1.955	F#4	-13.686	C#4	-11.731	D3	0.000	G4	-50.725	E4	-17.595	C#4	-33.237	A2	-19.551					D4	-21.506	B3	-37.147	D4	-21.506	D4	-21.506	F#3	-35.192	D3	-21.506
G4	-1.955	E4	3.910	A3	1.955	D3	0.000	A4	1.955	E4	3.911	B3	5.865	E3	3.911	G4	-50.725	E4	-17.595	C#4	-33.237	Bb2	-14.595	G4	-23.461	G4	-23.461											
F#4	-13.686	D4	0.000					G#4	-9.776							F4	-5.864	D4	-21.506	D4	-21.506	A2	-19.551	A4	-19.551	F#4	-35.192	D4	-21.506	A3	-19.551								
F#4	-13.686	D4	0.000	A3	1.955	D3	0.000	G#4	-9.776	E4	3.911	B3	5.865	E3	3.911	E4	-17.595	C#4	-33.237					B4	-15.641	E4	-17.596	D4	-48.770	G#3	-31.282								
E4	3.910	C#4	-11.731	A3	1.955	A2	1.955	A4	1.955	E4	3.911	C#4	-11.731	A2	1.955	F4	-12.640	D4	-48.770	B3	-15.641	G#2	-31.282	F#4	-35.192	D4	-21.506	A3	-19.551	A3	-19.551								
																E4	-17.595	C#4	-33.237	E3	-17.595	A2	-19.551	E4	-17.596	C#4	-33.237			A2	-19.551								
																												A3	-19.551										
																								F#4	-35.192	C#4	-33.237												
																								G4	-23.461	D4	-21.506	G3	-23.461	B2	-37.147								

Blue value: change of Pitch for the same written note

Green values: non-harmonic notes (appogiatura, passage note, anticipation)

Red values: analyses with different values

Cian fill: temperament

Dark pink values: probable use of a modified reference frequency

8.2 – EXTENDED INTONATION ANALYSIS I SCORE

Ave Verum Corpus_Tuning Table — Extended Just Intonation Analysis II

Difference in Cents from Equal Temperament

Phrases

First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
A4	1.955	F#4	-13.686	A3	1.955	D3	0.000	E4	3.911	E4	3.911	C#4	-11.731	A3	1.955	A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	F#4	-13.686	D4	0.000					G4	-1.955						
D5	0.000	F#4	-13.686	A3	1.955	D3	0.000	A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	F#4	-13.686	D4	0.000					D5	0.000						
F#4	-13.686							A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	A4	1.955	E4	3.911	C#4	-11.731	A3	1.955	F#4	-13.686	D4	0.000	B3	-15.641	G3	-1.955			F#4	-13.686	C4	-31.174	A3	1.955
A4	1.955	E4	-17.596	B3	-15.641	D3	0.000	G#4	-9.776			D4	-27.264	B3	5.865	Bb4	6.911					G3	-11.623	E4	3.910	C#4	-11.731							G4	-1.955	D4	0.000	Bb3	13.686
G#4	-31.282							G#4	-9.776	E4	3.911	D4	-27.264	B3	5.865	Bb4	6.911	E4	3.911	C#4	-11.731	G3	-11.623	D4	0.000	B3	-15.641					D#5	-7.821	F#4	7.820	C4	10.821	A3	-25.309
G4	-1.955	E4	-17.596	B3	-15.641	D3	0.000	E4	3.911	E4	3.911	B3	5.865							C4	17.596			G4	-1.955	E4	-17.596	B3	-15.641	G3	-1.955	E5	3.910	E4	3.910	B3	5.865	G#3	-9.776
G4	-29.219	E4	3.910	A3	1.955	C#3	-11.731	G#4	-9.776							Bb4	-13.577	E4	3.910	C4	17.596	C3	17.596	G4	-1.955	E4	-17.596	B3	-15.641	G3	-1.955	B4	5.865			D4	-27.264		
B4	5.865	G4	-29.219											E3	3.911	D5	21.506			Bb3	-13.577							A3	1.955	F#3	-13.686	C#5	-11.731			C#4	-11.731		
A4	1.955	F#4	-13.686	A3	1.955	C#3	-11.731	B4	5.865	G#4	-9.776	D4	-27.264	E3	3.911	C5	17.596			A3	1.955							G3	-1.955	E3	-17.596	D5	-27.264			B3	5.865		
G4	-29.219	E4	3.910					B4	5.865	G#4	-9.776	D4	-27.264	E#3	-25.417	Bb4	-13.577	E4	3.910	G3	19.552	C3	17.596	G4	-29.219	E4	3.910	C#4	-11.731	A3	1.955	C#5	-11.731			A3	1.955	G3	-29.219
G4	-1.955	E4	3.910	A3	1.955	D3	0.000	A4	1.955	A4	1.955	C#4	-11.731	F#3	-13.686	Bb4	-13.577	E4	3.910	G3	19.552	C3	17.596	G4	-29.219	E4	3.910	C#4	-11.731	A3	1.955	B4	-15.641	D4	0.000			
F#4	-13.686	D4	0.000					A4	1.955	A4	1.955	C#4	-11.731	F#3	-13.686	A4	1.955	F4	15.642	A3	1.955	F3	15.642	F#4	-13.686	D4	0.000					A4	1.955	C#4	-11.731				
F#4	-13.686	D4	0.000	A3	1.955	D3	0.000	A4	1.955							A4	1.955	F4	15.642	A3	1.955	F3	15.642	E4	3.910	C#4	-11.731					D5	0.000	D4	0.000	A3	1.955	F#3	-13.686
E4	3.910	C#4	-11.731	A3	1.955	A2	1.955	D5	-27.264							G4	-1.954	D4	0.000	B3	-15.641	F3	-33.128	A4	1.955	F#4	-13.686	C#4	-11.731	A3	1.955	G4	-1.955	D4	0.000	G3	-1.955	B2	-15.641
E4	3.910	C#4	-11.731	A3	1.955	A2	1.955			G#4	-9.776	D4	-27.264	B2	5.865	G4	-1.954	D4	0.000	B3	-15.641	F3	-33.128	A4	1.955	F#4	-13.686	C#4	-11.731	A3	1.955	F#4	-13.686	D4	0.000	A3	1.955	A2	1.955
F#4	-13.686	D4	0.000	A3	1.955	D3	0.000			A4	1.955	E4	3.911	C#3	-11.731	G4	-29.219	E4	3.911	C#4	-11.731	E3	3.911					B3	-15.641	G3	-1.955	E4	3.910	C#4	-11.731	G3	-29.219		
F#4	-13.686	D4	0.000	A3	1.955	D3	0.000	C#4	-11.731							Bb4	13.687	F4	15.642	D4	0.000	D3	0.000					A3	1.955	F#3	-13.686							A2	1.955
G4	-29.219	E4	3.910	A3	1.955	C#3	-11.731	B4	-15.641	F#4	-13.686	D4	0.000	D3	0.000	A4	1.955	E4	3.911	E4	3.911	C#3	-11.731					D4	0.000	B3	-15.641	E4	3.910	C#4	-11.731	G3	-29.219		
G4	-29.219	E4	3.910	A3	1.955	C#3	-11.731	A4	1.955	F#4	-13.686	C#4	-11.731	D3	0.000	G4	-29.219	E4	3.911	C#4	-11.731	A2	1.955					D4	0.000	B3	-15.641	D4	0.000	D4	0.000	F#3	-13.686	D3	0.000
G4	-1.955	E4	3.910	A3	1.955	D3	0.000	A4	1.955	E4	3.911	B3	5.865	E3	3.911	G4	-29.219	E4	3.911	C#4	-11.731	Bb2	6.911	G4	-1.955	G4	-1.955											
F#4	-13.686	D4	0.000					G#4	-9.776							F4	15.642	D4	0.000	D4	0.000	A2	1.955	A4	1.955	F#4	-13.686	D4	0.000	A3	1.955								
F#4	-13.686	D4	0.000	A3	1.955	D3	0.000	G#4	-9.776	E4	3.911	B3	5.865	E3	3.911	E4	3.911	C#4	-11.731					B4	5.865	E4	3.910	D4	-27.264	G#3	-9.776								
E4	3.910	C#4	-11.731	A3	1.955	A2	1.955	A4	1.955	E4	3.911	C#4	-11.731	A2	1.955	F4	8.866	D4	-27.264	B3	5.865	G#2	-9.776	F#4	-13.686	D4	0.000	A3	1.955	A3	1.955								
																E4	3.911	C#4	-11.731	E3	3.911	A2	1.955	E4	3.910	C#4	-11.731			A2	1.955								
																												A3	1.955										
																								F#4	-13.686	C#4	-11.731												
																								G4	-1.955	D4	0.000	G3	-1.955	B2	-15.641								

Blue value: change of Pitch for the same written note

Green values: non-harmonic notes (appogiatura, passage note, anticipation)

Red values: analyses with different values

Cian fill: temperament

Dark pink values: probable use of a modified reference frequency

8.3 – Extended intonation analysis II score

Ave Verum Corpus_Tuning Table — Pythagorean Intonation

Difference in Cents from Equal Temperament

Phrases

First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
A4	1.955	F#4	7.820	A3	1.955	D3	0.000	E4	3.910	E4	3.910	C#4	9.775	A3	1.955	A4	1.955	E4	3.910	C#4	9.775	A3	1.955	F#4	7.820	D4	0.000					G4	-1.955						
D5	0.000	F#4	7.820	A3	1.955	D3	0.000	A4	1.955	E4	3.910	C#4	9.775	A3	1.955	A4	1.955	E4	3.910	C#4	9.775	A3	1.955	F#4	7.820	D4	0.000					D5	0.000						
F#4	7.820							A4	1.955	E4	3.910	C#4	9.775	A3	1.955	A4	1.955	E4	3.910	C#4	9.775	A3	1.955	F#4	7.820	D4	0.000	B3	5.865	G3	-1.955			F#4	7.820	C4	-3.910	A3	1.955
A4	1.955	E4	3.910	B3	5.865	D3	0.000	G#4	11.730			D4	0.000	B3	5.865	Bb4	-7.820					G3	-1.955	E4	3.910	C#4	9.775							G4	-1.955	D4	0.000	Bb3	-7.820
G#4	11.730							G#4	11.730	E4	3.910	D4	0.000	B3	5.865	Bb4	-7.820	E4	3.910	C#4	9.775	G3	-1.955	D4	0.000	B3	5.865					D#5	13.685	F#4	7.820	C4	-3.910	A3	1.955
G4	-1.955	E4	3.910	B3	5.865	D3	0.000	E4	3.910	E4	3.910	B3	5.865							C4	-3.910			G4	-1.955	E4	3.910	B3	5.865	G3	-1.955	E5	3.910	E4	3.910	B3	5.865	G#3	11.730
G4	-1.955	E4	3.910	A3	1.955	C#3	9.775	G#4	11.730							Bb4	-7.820	E4	3.910	C4	-3.910	C3	-3.910	G4	-1.955	E4	3.910	B3	5.865	G3	-1.955	B4	5.865			D4	0.000		
B4	5.865	G4	-1.955											E3	3.910	D5	0.000			Bb3	-7.820							A3	1.955	F#3	7.820	C#5	9.775			C#4	9.775		
A4	1.955	F#4	7.820	A3	1.955	C#3	9.775	B4	5.865	G#4	11.730	D4	0.000	E3	3.910	C5	-3.910			A3	1.955							G3	-1.955	E3	3.910	D5	0.000			B3	5.865		
G4	-1.955	E4	3.910					B4	5.865	G#4	11.730	D4	0.000	E#3	17.595	Bb4	-7.820	E4	3.910	G3	-1.955	C3	-3.910	G4	-1.955	E4	3.910	C#4	9.775	A3	1.955	C#5	9.775			A3	1.955	G3	-1.955
G4	-1.955	E4	3.910	A3	1.955	D3	0.000	A4	1.955	A4	1.955	C#4	9.775	F#3	7.820	Bb4	-7.820	E4	3.910	G3	-1.955	C3	-3.910	G4	-1.955	E4	3.910	C#4	9.775	A3	1.955	B4	5.865	D4	0.000				
F#4	7.820	D4	0.000					A4	1.955	A4	1.955	C#4	9.775	F#3	7.820	A4	1.955	F4	-5.865	A3	1.955	F3	-5.865	F#4	7.820	D4	0.000					A4	1.955	C#4	9.775				
F#4	7.820	D4	0.000	A3	1.955	D3	0.000	A4	1.955							A4	1.955	F4	-5.865	A3	1.955	F3	-5.865	E4	3.910	C#4	9.775					D5	0.000	D4	0.000	A3	1.955	F#3	7.820
E4	3.910	C#4	9.775	A3	1.955	A2	1.955	D5	0.000							G4	-1.955	D4	0.000	B3	5.865	F3	-5.865	A4	1.955	F#4	7.820	C#4	9.775	A3	1.955	G4	-1.955	D4	0.000	G3	-1.955	B2	5.865
E4	3.910	C#4	9.775	A3	1.955	A2	1.955			G#4	11.730	D4	0.000	B2	5.865	G4	-1.955	D4	0.000	B3	5.865	F3	-5.865	A4	1.955	F#4	7.820	C#4	9.775	A3	1.955	F#4	7.820	D4	0.000	A3	1.955	A2	1.955
F#4	7.820	D4	0.000	A3	1.955	D3	0.000			A4	1.955	E4	3.910	C#3	9.775	G4	-1.955	E4	3.910	C#4	9.775	E3	3.910					B3	5.865	G3	-1.955	E4	3.910	C#4	9.775	G3	-1.955		
F#4	7.820	D4	0.000	A3	1.955	D3	0.000	C#4	9.775							Bb4	-7.820	F4	-5.865	D4	0.000	D3	0.000					A3	1.955	F#3	7.820							A2	1.955
G4	-1.955	E4	3.910	A3	1.955	C#3	9.775	B4	5.865	F#4	7.820	D4	0.000	D3	0.000	A4	1.955	E4	3.910	E4	3.910	C#3	9.775					D4	0.000	B3	5.865	E4	3.910	C#4	9.775	G3	-1.955		
G4	-1.955	E4	3.910	A3	1.955	C#3	9.775	A4	1.955	F#4	7.820	C#4	9.775	D3	0.000	G4	-1.955	E4	3.910	C#4	9.775	A2	1.955					D4	0.000	B3	5.865	D4	0.000	D4	0.000	F#3	7.820	D3	0.000
G4	-1.955	E4	3.910	A3	1.955	D3	0.000	A4	1.955	E4	3.910	B3	5.865	E3	3.910	G4	-1.955	E4	3.910	C#4	9.775	Bb2	-7.820	G4	-1.955	G4	-1.955										
F#4	7.820	D4	0.000					G#4	11.730							F4	-5.865	D4	0.000	D4	0.000	A2	1.955	A4	1.955	F#4	7.820	D4	0.000	A3	1.955								
F#4	7.820	D4	0.000	A3	1.955	D3	0.000	G#4	11.730	E4	3.910	B3	5.865	E3	3.910	E4	3.910	C#4	9.775					B4	5.865	E4	3.910	D4	0.000	G#3	11.730								
E4	3.910	C#4	9.775	A3	1.955	A2	1.955	A4	1.955	E4	3.910	C#4	9.775	A2	1.955	F4	-5.865	D4	0.000	B3	5.865	G#2	11.730	F#4	7.820	D4	0.000	A3	1.955	A3	1.955								
																E4	3.910	C#4	9.775	E3	3.910	A2	1.955	E4	3.910	C#4	9.775			A2	1.955								
																												A3	1.955										
																								F#4	7.820	C#4	9.775												
																								G4	-1.955	D4	0.000	G3	-1.955	B2	5.865								

8.4 – PYTHAGOREAN EXTENDED INTONATION ANALYSIS

Ave Verum Corpus_Tuning Table — Meantone Temperament

Difference in Cents from Equal Temperament

Phrases

First Phrase								Second Phrase								Third Phrase							
Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
A4	-3.421	F#4	-13.686	A3	-3.421	D3	0.000	E4	-6.843	E4	-6.843	C#4	-17.108	A3	-3.421	A4	-3.421	E4	-6.843	C#4	-17.108	A3	-3.421
D5	0.000	F#4	-13.686	A3	-3.421	D3	0.000	A4	-3.421	E4	-6.843	C#4	-17.108	A3	-3.421	A4	-3.421	E4	-6.843	C#4	-17.108	A3	-3.421
F#4	-13.686							A4	-3.421	E4	-6.843	C#4	-17.108	A3	-3.421	A4	-3.421	E4	-6.843	C#4	-17.108	A3	-3.421
A4	-3.421	E4	-6.843	B3	-10.264	D3	0.000	G#4	-20.530			D4	0.000	B3	-10.264	Bb4	13.686					G3	3.422
G#4	-20.530							G#4	-20.530	E4	-6.843	D4	0.000	B3	-10.264	Bb4	13.686	E4	-6.843	C#4	-17.108	G3	3.422
G4	3.422	E4	-6.843	B3	-10.264	D3	0.000	E4	-6.843	E4	-6.843	B3	-10.264							C4	6.843		
G4	3.422	E4	-6.843	A3	-3.421	C#3	-17.108	G#4	-20.530							Bb4	13.686	E4	-6.843	C4	6.843	C3	6.843
B4	-10.264	G4	3.422											E3	-6.843	D5	0.000			Bb3	13.686		
A4	-3.421	F#4	-13.686	A3	-3.421	C#3	-17.108	B4	-10.264	G#4	-20.530	D4	0.000	E3	-6.843	C5	6.843			A3	-3.421		
G4	3.422	E4	-6.843					B4	-10.264	G#4	-20.530	D4	0.000	E#3	-30.794	Bb4	13.686	E4	-6.843	G3	3.422	C3	6.843
G4	3.422	E4	-6.843	A3	-3.421	D3	0.000	A4	-3.421	A4	-3.421	C#4	-17.108	F#3	-13.686	Bb4	13.686	E4	-6.843	G3	3.422	C3	6.843
F#4	-13.686	D4	0.000					A4	-3.421	A4	-3.421	C#4	-17.108	F#3	-13.686	A4	-3.421	F4	10.265	A3	-3.421	F3	10.265
F#4	-13.686	D4	0.000	A3	-3.421	D3	0.000	A4	-3.421							A4	-3.421	F4	10.265	A3	-3.421	F3	10.265
E4	-6.843	C#4	-17.108	A3	-3.421	A2	-3.421	D5	0.000							G4	3.422	D4	0.000	B3	-10.264	F3	10.265
E4	-6.843	C#4	-17.108	A3	-3.421	A2	-3.421			G#4	-20.530	D4	0.000	B2	-10.264	G4	3.422	D4	0.000	B3	-10.264	F3	10.265
F#4	-13.686	D4	0.000	A3	-3.421	D3	0.000			A4	-3.421	E4	-6.843	C#3	-17.108	G4	3.422	E4	-6.843	C#4	-17.108	E3	-6.843
F#4	-13.686	D4	0.000	A3	-3.421	D3	0.000	C#4	-17.108							Bb4	13.686	F4	10.265	D4	0.000	D3	0.000
G4	3.422	E4	-6.843	A3	-3.421	C#3	-17.108	B4	-10.264	F#4	-13.686	D4	0.000	D3	0.000	A4	-3.421	E4	-6.843	E4	-6.843	C#3	-17.108
G4	3.422	E4	-6.843	A3	-3.421	C#3	-17.108	A4	-3.421	F#4	-13.686	C#4	-17.108	D3	0.000	G4	3.422	E4	-6.843	C#4	-17.108	A2	-3.421
G4	3.422	E4	-6.843	A3	-3.421	D3	0.000	A4	-3.421	E4	-6.843	B3	-10.264	E3	-6.843	G4	3.422	E4	-6.843	C#4	-17.108	Bb2	13.686
F#4	-13.686	D4	0.000					G#4	-20.530							F4	10.265	D4	0.000	D4	0.000	A2	-3.421
F#4	-13.686	D4	0.000	A3	-3.421	D3	0.000	G#4	-20.530	E4	-6.843	B3	-10.264	E3	-6.843	E4	-6.843	C#4	-17.108				
E4	-6.843	C#4	-17.108	A3	-3.421	A2	-3.421	A4	-3.421	E4	-6.843	C#4	-17.108	A2	-3.421	F4	10.265	D4	0.000	B3	-10.264	G#2	-20.530
																E4	-6.843	C#4	-17.108	E3	-6.843	A2	-3.421

Fourth Phrase								Fifth Phrase							
Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
F#4	-13.686	D4	0.000					G4	3.422						
F#4	-13.686	D4	0.000	B3	-10.264	G3	3.422	D5	0.000						
E4	-6.843	C#4	-17.108							F#4	-13.686	C4	6.843	A3	-3.421
D4	0.000	B3	-10.264							G4	3.422	D4	0.000	Bb3	13.686
G4	3.422	E4	-6.843	B3	-10.264	G3	3.422	D#5	-23.951	F#4	-13.686	C4	6.843	A3	-3.421
G4	3.422	E4	-6.843	B3	-10.264	G3	3.422	E5	-6.843	E4	-6.843	B3	-10.264	G#3	-20.530
				A3	-3.421	F#3	-13.686	B4	-10.264			D4	0.000		
G3	3.422	E3	-6.843					C#5	-17.108			C#4	-17.108		
G4	3.422	E4	-6.843	C#4	-17.108	A3	-3.421	D5	0.000			B3	-10.264		
G4	3.422	E4	-6.843	C#4	-17.108	A3	-3.421	C#5	-17.108			A3	-3.421	G3	3.422
F#4	-13.686	D4	0.000					B4	-10.264	D4	0.000				
E4	-6.843	C#4	-17.108					A4	-3.421	C#4	-17.108				
A4	-3.421	F#4	-13.686	C#4	-17.108	A3	-3.421	D5	0.000	D4	0.000	A3	-3.421	F#3	-13.686
				B3	-10.264	G3	3.422	G4	3.422	D4	0.000	G3	3.422	B2	-10.264
				A3	-3.421	F#3	-13.686	F#4	-13.686	D4	0.000	A3	-3.421	A2	-3.421
				D4	0.000	B3	-10.264	E4	-6.843	C#4	-17.108	G3	3.422		
				D4	0.000	B3	-10.264	D4	0.000	D4	0.000	F#3	-13.686	D3	0.000
G4	3.422	G4	3.422												
A4	-3.421	F#4	-13.686	D4	0.000	A3	-3.421								
B4	-10.264	E4	-6.843	D4	0.000	G#3	-20.530								
F#4	-13.686	D4	0.000	A3	-3.421	A3	-3.421								
E4	-6.843	C#4	-17.108			A2	-3.421								
				A3	-3.421										
F#4	-13.686	C#4	-17.108												
G4	3.422	D4	0.000	G3	3.422	B2	-10.264								

Ave Verum Corpus_Keyboard Layout for Yamaha SY 99 (Middle C: C3)

Notes	Sub-Indexes	Reference Frequency	Cents -> ET	Steps -> SY	Keyboard Key
E4	0	D2	3.910	3.3	C#7
D#4	-1	D2	-7.821	-6.7	C7
D4	+1	A1	+19.551	16.7	B6
	0	D2	0.000	0.0	Bb6
	0	A1	-1.955	-1.7	A6
	-z	D2	-27.264	-23.3	G#6
	-z	A1	-29.219	-24.9	G6
C#4	-1	D2	-11.731	-10.0	F#6
	-1	A1	-13.686	-11.7	F6
C4	+1	A1	+29.326	25.0	E6
	0	A1	+7.820	6.7	D#6
B3	0	D2	+5.865	5.0	D6
	0	A1	+3.910	3.3	C#6
	-1	D2	-15.641	-13.3	C6
	-1	A1	-17.596	-15.0	B5
	-(k+z)	A1	-44.860	-38.3	Bb5
Bb3	+1	A1	+11.732	10.0	A5
	+(k-y)	A1	+4.955	4.2	G#5
	+(k-z)	A1	-15.532	-13.3	G5
	-z	A1	-37.039	-31.6	F#5
A3	0	D2	+1.955	1.7	F5
	0	A1	0.000	0.0	E5
	-1	A1	-21.506	-18.4	D#5
G#3	-2	D2	-31.282	-26.7	D5
	-1	A1	-11.731	-10.0	C#5
G3	0	D2	-1.955	-1.7	C5
	0	A1	-3.910	-3.3	B4
	-z	D2	-29.219	-24.9	Bb4
	-z	A1	-31.174	-26.6	A4
F#3	0	D2	7.820	6.7	G#4
	-1	D2	-13.686	-11.7	G4
	-1	A1	-15.641	-13.3	F#4
F3	+1	A1	+13.687	11.7	F4
	+(k-y)	A1	+6.910	5.9	E4
	0	A1	-7.819	-6.7	D#4
E3	0	D2	+3.910	3.3	D4
	0	A1	+1.955	1.7	C#4
	-1	D2	-17.596	-15.0	C4
	-1	A1	-19.552	-16.7	B3
D3	0	D2	0.000	0.0	Bb3
	0	A1	-1.955	-1.7	A3
	-y	A1	-8.731	-7.5	G#3
	-z	D2	-27.264	-23.3	G3
	-z	A1	-29.219	-24.9	F#3

Notes	Sub-Indexes	Reference Frequency	Cents -> ET	Steps -> SY	Keyboard Key
C#3	-1	D2	-11.731	-10.0	F3
	-1	A1	-13.686	-11.7	E3
C3	+1	A1	+29.326	25.0	D#3
	+(k-y)	D2	+10.821	9.2	D3
	0	A1	+7.820	6.7	C#3
	-z	D2	-31.174	-26.6	C3
B2	0	D2	+5.865	5.0	B2
	0	A1	+3.910	3.3	Bb2
	-1	D2	-15.641	-13.3	A2
	-1	A1	-17.596	-15.0	G#2
Bb2	+1	D2	+13.686	11.7	G2
	+(k-z)	A1	-15.532	-13.3	F#2
	-z	A1	-37.039	-31.6	F2
A2	0	D2	+1.995	1.7	E2
	0	A1	0.000	0.0	D#2
	-1	A1	-21.506	-18.4	D2
	-z	D2	-25.309	-21.6	C#2
G#2	-1	D2	-9.776	-8.3	C2
G2	+1	A1	+17.596	15.0	B1
	0	D2	-1.955	-1.7	Bb1
	0	A1	-3.910	-3.3	A1
	-z	D2	-29.219	-24.9	G#1
	-z	A1	-31.174	-26.6	G1
F#2	-1	D2	-13.686	-11.7	F#1
	-1	A1	-15.641	-13.3	F1
F2	+1	A1	+13.687	11.7	E1
	0	A1	-7.819	-6.7	D#1
	-z	A1	-35.084	-29.9	D1
E#2	-2	A1	-27.373	-23.4	C#1
E2	0	A1	+1.995	1.7	C1
	-1	D2	-17.596	-15.0	B0
D2	0	D2	0.000	0.0	Bb0
	0	A1	-1.955	-1.7	A0
C#2	-1	D2	-11.731	-10.0	G#0
	-1	A1	-13.686	-11.7	G0
C2	+1	A1	+29.326	25.0	F#0
	0	A1	+7.820	6.7	F0
B1	-1	D2	-15.641	-13.3	E0
	0	A1	3.910	3.3	D#0
Bb1	+(k-y)	A1	+4.955	4.2	D0
A1	0	D2	+1.995	1.7	C#0
	0	A1	0.000	0.0	C0
G#1	-1	A1	-11.731	-10.0	B -1

8.6 – YAMAHA SY-99 KEYBOARD LAYOUT

APPENDIX 9

9 - TUNING TABLES – REPLICATIONS

9 – TUNING TABLES REPLICATIONS

Ave Verum Corpus_Tuning Table — RAM Quartet Average Deviations

Difference in Cents from Equal Temperament

Phrases

First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
A4	8.333	F#4	0.367	A3	8.965	D3	4.162	E4	-14.340	E4	1.893	C#4	-14.034	A3	-4.110	A4	6.966	E4	10.903	C#4	-12.153	A3	0.902	F#4	-9.295	D4	2.164					G4	-17.203							
D5	9.065	F#4	2.059	A3	2.217	D3	4.282	A4	3.645	E4	-5.903	C#4	-13.823	A3	-2.799	A4	0.836	E4	10.248	C#4	-16.557	A3	8.891	F#4	-3.690	D4	0.360					D5	-12.009							
F#4	1.938							A4	6.703	E4	-8.750	C#4	-9.629	A3	-2.654	A4	8.318	E4	1.503	C#4	-29.798	A3	-10.559	F#4	-4.691	D4	-0.831	B3	-26.979	G3	-23.960			F#4	-19.538	C4	-20.630	A3	-27.434		
A4	14.966	E4	3.893	B3	-13.005	D3	-5.548	G#4	7.591			D4	-12.423	B3	-25.738	Bb4	-22.879					G3	-4.590	E4	-1.913	C#4	3.595							G4	-33.034	D4	-37.636	Bb3	-30.930		
G#4	11.317							G#4	14.453	E4	8.691	D4	-9.051	B3	-6.185	Bb4	-14.498	E4	3.011	C#4	-27.783	G3	5.426	D4	3.303	B3	-0.253					D#5	-36.906	F#4	-9.483	C4	-36.914	A3	-21.101		
G4	-1.691	E4	0.731	B3	-23.575	D3	-0.276	E4	4.428	E4	13.656	B3	-5.351							C4	-8.317			G4	-16.756	E4	4.035	B3	-32.359	G3	-24.850	E5	-2.243	E4	-16.665	B3	-18.615	G#3	-18.135		
G4	-7.380	E4	3.842	A3	-4.130	C#3	-6.035	G#4	0.153							Bb4	-9.630	E4	-12.322	C4	-24.651	C3	-12.099	G4	-20.500	E4	-4.193	B3	-28.616	G3	-25.997	B4	-37.589			D4	-34.941			
B4	1.853	G4	-2.436											E3	-9.924	D5	-23.698			Bb3	-40.331							A3	-23.457	F#3	-12.833	C#5	-14.492			C#4	-42.582		
A4	2.649	F#4	11.408	A3	-3.691	C#3	1.795	B4	5.745	G#4	-8.746	D4	-16.569	E3	0.423	C5	-14.256			A3	-26.765							G3	0.760	E3	6.102	D5	-17.904			B3	-44.887		
G4	-2.957	E4	8.591					B4	-0.902	G#4	-14.566	D4	-25.298	E#3	-14.498	Bb4	-17.009	E4	-12.418	G3	-22.207	C3	-26.379	G4	-13.705	E4	-4.859	C#4	-21.149	A3	-21.806	C#5	-1.213			A3	-29.565	G3	-22.023		
G4	14.047	E4	14.680	A3	-4.336	D3	-11.508	A4	-2.957	A4	-9.022	C#4	-17.660	F#3	-14.304	Bb4	-11.961	E4	-11.944	G3	-27.860	C3	-19.048	G4	-24.220	E4	-12.672	C#4	-33.044	A3	-26.948	B4	-8.977	D4	-11.565				
F#4	3.950	D4	3.448					A4	-10.656	A4	-0.308	C#4	-17.206	F#3	-9.754	A4	-19.024	F4	-25.732	A3	-29.188	F3	-24.796	F#4	-24.679	D4	-1.239					A4	-27.563	C#4	-13.151				
F#4	30.638	D4	13.394	A3	3.346	D3	-7.396	A4	4.343							A4	-8.362	F4	-14.274	A3	-20.085	F3	-5.387	E4	-5.832	C#4	-1.593					D5	8.428	D4	-3.034	A3	-13.739	F#3	-3.117	
E4	-0.374	C#4	-3.761	A3	-3.654	A2	-2.132	D5	7.533							G4	-16.652	D4	-11.368	B3	-9.552	F3	-11.689	A4	-5.397	F#4	-11.534	C#4	-25.033	A3	-18.392	G4	-23.680	D4	-7.341	G3	-33.447	B2	-31.731	
E4	14.697	C#4	4.270	A3	6.772	A2	5.233			G#4	0.294	D4	-12.569	B2	-35.772	G4	-22.349	D4	-6.326	B3	-20.093	F3	-21.982	A4	-23.096	F#4	-7.837	C#4	-44.793	A3	-34.249	F#4	-27.906	D4	-11.715	A3	-34.121	A2	-21.961	
F#4	18.069	D4	9.326	A3	7.468	D3	-6.942			A4	0.336	E4	-6.299	C#3	-4.193	G4	-16.391	E4	-11.004	C#4	-20.400	E3	-13.226					B3	-33.481	G3	-27.545	E4	-34.508	C#4	-9.231	G3	-41.491			
F#4	11.546	D4	4.383	A3	-0.151	D3	-8.411	C#4	3.109							Bb4	-31.144	F4	-17.735	D4	-15.403	D3	-20.233					A3	-2.328	F#3	-15.837							A2	-28.881	
G4	-1.764	E4	16.386	A3	-0.054	C#3	-2.250	B4	-0.757	F#4	-2.173	D4	-13.338	D3	-15.766	A4	-17.453	E4	6.945	E4	-19.330	C#3	-15.533					D4	-21.519	B3	-27.511	E4	-14.617	C#4	-4.399	G3	-29.795			
G4	-11.276	E4	1.955	A3	-5.469	C#3	-8.210	A4	-6.796	F#4	-7.891	C#4	-22.926	D3	-19.425	G4	-26.050	E4	-14.112	C#4	-20.002	A2	-18.657					D4	-30.000	B3	-15.697	D4	-11.548	D4	-6.094	F#3	-21.676	D3	-15.011	
G4	-0.521	E4	13.314	A3	-4.121	D3	0.911	A4	1.972	E4	-8.922	B3	-15.355	E3	-7.857	G4	-21.800	E4	-19.231	C#4	-30.764	Bb2	-27.166	G4	-26.079	G4	-26.693												
F#4	2.029	D4	10.324					G#4	11.155							F4	-16.617	D4	-10.268	D4	-24.180	A2	-7.761	A4	-14.436	F#4	-8.629	D4	-13.034	A3	-12.007									
F#4	-5.448	D4	6.454	A3	1.932	D3	-0.917	G#4	13.215	E4	4.454	B3	-10.469	E3	2.762	E4	-12.668	C#4	-7.790					B4	-10.873	E4	-14.704	D4	-28.923	G#3	-26.845									
E4	-0.184	C#4	-0.358	A3	-3.185	A2	0.097	A4	6.217	E4	7.003	C#4	-15.818	A2	-2.894	F4	-2.940	D4	-10.359	B3	-21.747	G#2	-17.724	F#4	-28.614	D4	-14.624	A3	-26.247	A3	-23.135								
																E4	-8.663	C#4	-4.911	E3	-19.580	A2	-8.861	E4	-21.382	C#4	-15.023			A2	-27.651								
																												A3	-34.764										
																								F#4	5.301	C#4	-9.251												
																								G4	-20.191	D4	-19.776	G3	-28.376	B2	-17.937								

9.1 – Royal Academy of Music vocal quartet's average deviations

Ave Verum Corpus_Tuning Table — The BBC Singers Average Deviations

Difference in Cents from Equal Temperament

Phrases

First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass		Sop		Alto		Tenor		Bass	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
A4	6.632	F#4	2.715	A3	-1.606	D3	-5.915	E4	1.521	E4	-1.809	C#4	-11.623	A3	-0.381	A4	12.048	E4	14.588	C#4	10.188	A3	14.131	F#4	-5.902	D4	4.833					G4	18.342							
D5	10.474	F#4	0.234	A3	-1.321	D3	-1.641	A4	-0.303	E4	-5.640	C#4	-8.755	A3	-0.803	A4	11.942	E4	9.331	C#4	-0.411	A3	11.004	F#4	2.067	D4	8.044					D5	14.250							
F#4	3.755							A4	-1.010	E4	-1.285	C#4	-6.527	A3	1.938	A4	7.269	E4	3.029	C#4	-8.714	A3	-1.603	F#4	-3.216	D4	6.998	B3	-4.339	G3	-12.053			F#4	14.294	C4	10.666	A3	5.650		
A4	5.742	E4	1.643	B3	-6.574	D3	-7.817	G#4	3.598			D4	-11.097	B3	0.860	Bb4	-9.733					G3	-8.173	E4	4.069	C#4	10.987							G4	0.123	D4	4.448	Bb3	-2.537		
G#4	15.319							G#4	1.397	E4	6.930	D4	-1.974	B3	16.253	Bb4	-2.568	E4	9.233	C#4	1.361	G3	2.460	D4	22.172	B3	11.011					D#5	2.849	F#4	4.682	C4	4.217	A3	-2.023		
G4	5.048	E4	-1.056	B3	-8.212	D3	-7.129	E4	10.353	E4	15.230	B3	1.345							C4	3.628			G4	8.522	E4	10.881	B3	-4.581	G3	2.833	E5	2.034	E4	6.500	B3	7.177	G#3	-2.796		
G4	9.880	E4	-0.764	A3	-1.752	C#3	1.822	G#4	8.143							Bb4	-1.126	E4	-2.345	C4	-11.088	C3	-18.892	G4	3.488	E4	1.808	B3	-3.127	G3	-2.132	B4	8.574			D4	-10.141				
B4	3.678	G4	1.279											E3	-1.835	D5	-2.240			Bb3	-19.472							A3	-7.966	F#3	-3.548	C#5	16.353			C#4	-5.726				
A4	9.008	F#4	8.124	A3	2.280	C#3	11.096	B4	3.378	G#4	7.465	D4	-16.292	E3	-6.134	C5	-6.228			A3	-16.393							G3	5.173	E3	7.427	D5	7.588			B3	-4.917				
G4	12.761	E4	3.822					B4	-2.212	G#4	7.872	D4	-11.964	E#3	-12.979	Bb4	1.440	E4	-5.186	G3	-17.377	C3	-14.317	G4	11.882	E4	3.228	C#4	4.794	A3	9.650	C#5	16.829			A3	-4.360	G3	-3.597		
G4	8.632	E4	0.392	A3	1.226	D3	-5.689	A4	-0.320	A4	-1.875	C#4	-12.691	F#3	-15.540	Bb4	-7.498	E4	-1.985	G3	-16.237	C3	-10.956	G4	4.668	E4	-3.386	C#4	-10.105	A3	-4.483	B4	7.909	D4	2.057					
F#4	7.320	D4	1.964					A4	1.638	A4	1.176	C#4	-4.531	F#3	1.077	A4	-1.013	F4	-15.373	A3	-15.722	F3	-10.564	F#4	12.635	D4	1.246					A4	8.312	C#4	9.004					
F#4	14.433	D4	3.403	A3	9.751	D3	6.132	A4	4.736							A4	7.100	F4	-2.620	A3	-1.985	F3	20.153	E4	15.774	C#4	16.243					D5	14.884	D4	13.409	A3	6.907	F#3	19.182		
E4	6.190	C#4	0.314	A3	2.203	A2	-6.213	D5	13.806							G4	9.479	D4	3.829	B3	7.295	F3	4.947	A4	10.623	F#4	8.344	C#4	1.533	A3	-0.041	G4	5.392	D4	11.538	G3	1.365	B2	-1.894		
E4	15.668	C#4	5.015	A3	3.639	A2	5.544			G#4	9.047	D4	-6.644	B2	-7.889	G4	7.119	D4	7.001	B3	-3.694	F3	-10.876	A4	8.902	F#4	2.354	C#4	-9.219	A3	-10.750	F#4	3.629	D4	7.642	A3	1.470	A2	-6.392		
F#4	2.639	D4	-2.384	A3	2.989	D3	-0.251			A4	10.025	E4	1.137	C#3	6.247	G4	14.804	E4	5.586	C#4	2.186	E3	1.856					B3	-6.896	G3	-12.904	E4	1.845	C#4	5.211	G3	-4.681				
F#4	2.000	D4	2.503	A3	3.509	D3	-8.476	C#4	14.004							Bb4	-2.406	F4	4.866	D4	-6.030	D3	-6.542					A3	8.220	F#3	7.154							A2	-4.042		
G4	1.992	E4	2.471	A3	9.947	C#3	18.917	B4	1.531	F#4	-0.406	D4	-6.316	D3	-1.485	A4	2.877	E4	7.460	E4	-2.347	C#3	3.179					D4	4.246	B3	1.241	E4	5.685	C#4	11.896	G3	5.883				
G4	-0.224	E4	-4.476	A3	-2.333	C#3	5.722	A4	2.391	F#4	3.517	C#4	-5.747	D3	-0.520	G4	-7.715	E4	-2.883	C#4	-2.996	A2	-15.652					D4	-6.685	B3	-3.773	D4	5.679	D4	3.036	F#3	7.506	D3	1.238		
G4	5.258	E4	3.557	A3	9.623	D3	12.969	A4	3.809	E4	2.332	B3	-3.588	E3	-1.424	G4	-5.524	E4	-3.775	C#4	-8.708	Bb2	-8.061	G4	8.528	G4	-1.859												
F#4	11.595	D4	5.391					G#4	12.234							F4	-3.253	D4	-1.463	D4	-16.270	A2	-12.749	A4	11.620	F#4	4.934	D4	17.192	A3	15.492								
F#4	4.880	D4	10.319	A3	8.534	D3	9.465	G#4	14.163	E4	5.063	B3	7.669	E3	6.284	E4	1.787	C#4	16.311					B4	12.680	E4	-7.988	D4	4.205	G#3	3.254								
E4	4.649	C#4	1.720	A3	1.633	A2	-5.444	A4	4.512	E4	0.212	C#4	-4.557	A2	-4.203	F4	5.952	D4	6.074	B3	-2.773	G#2	6.548	F#4	1.855	D4	1.999	A3	-0.292	A3	0.985								
																E4	-0.824	C#4	0.409	E3	-11.641	A2	-10.665	E4	9.733	C#4	3.187			A2	-12.348								
																												A3	1.019										
																								F#4	12.444	C#4	11.206												
																								G4	2.523	D4	-2.744	G3	-5.256	B2	-7.529								

Ave Verum Corpus_Tuning Table — The BBC Singers_Soprano Section Average Deviations

Difference in Cents from Equal Temperament

Phrases																															
First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Sop I		Sop II		Sop III		Sop IV		Sop I		Sop II		Sop III		Sop IV		Sop I		Sop II		Sop III		Sop IV		Sop I		Sop II		Sop III		Sop IV		Sop I		Sop II		Sop III		Sop IV	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
A4	23.457	A4	11.957	A4	-7.134	A4	-1.995	E4	10.089	E4	-0.160	E4	-4.911	E4	1.815	A4	23.181	A4	20.312	A4	0.877	A4	3.705	F#4	3.095	F#4	-2.272	F#4	-13.66	F#4	-10.89	G4	26.867	G4	15.37	G4	17.99	G4	13.11
D5	20.535	D5	26.837	D5	-0.708	D5	-5.059	A4	12.641	A4	1.653	A4	-7.936	A4	-6.867	A4	24.716	A4	13.582	A4	6.465	A4	2.919	F#4	6.524	F#4	-4.692	F#4	06.59	F#4	-00.25	D5	26.422	D5	11.76	D5	10.76	D5	08.00
F#4	18.721	F#4	-02.44	F#4	-04.80	F#4	03.36	A4	-1.738	A4	-3.423	A4	1.294	A4	0.607	A4	10.855	A4	9.979	A4	6.851	A4	1.371	F#4	1.936	F#4	3.449	F#4	-4.615	F#4	-13.759								
A4	6.721	A4	4.544	A4	3.585	A4	8.037	G#4	12.171	G#4	-07.59	G#4	-2.963	G#4	13.461	Bb4	6.809	Bb4	-09.81	Bb4	-22.41	Bb4	-13.659	E4	9.061	E4	3.471	E4	-02.25	E4	05.90								
G#4	24.112	G#4	04.52	G#4	13.38	G#4	19.13	G#4	15.296	G#4	-7.885	G#4	-3.786	G#4	2.653	Bb4	11.566	Bb4	3.748	Bb4	-7.357	Bb4	-18.380	D4	31.050	D4	10.736	D4	18.54	D4	28.21	D#5	21.073	D#5	3.674	D#5	-0.102	D#5	-13.422
G4	14.549	G4	7.231	G4	-12.874	G4	11.077	E4	21.396	E4	8.992	E4	7.813	E4	03.94									G4	28.617	G4	3.992	G4	9.601	G4	-8.397	E5	15.477	E5	8.961	E5	-7.398	E5	-9.031
G4	13.293	G4	11.140	G4	2.033	G4	12.953	G#4	14.178	G#4	06.29	G#4	07.75	G#4	05.13	Bb4	16.913	Bb4	3.044	Bb4	-6.000	Bb4	-18.662	G4	12.876	G4	4.270	G4	-8.170	G4	4.840	B4	18.192	B4	00.47	B4	18.353	B4	-02.83
B4	16.046	B4	3.727	B4	01.12	B4	-06.34									D5	17.019	D5	06.40	D5	-12.617	D5	-20.02									C#5	21.621	C#5	18.44	C#5	10.828	C#5	14.50
A4	15.956	A4	17.796	A4	-4.027	A4	6.144	B4	18.050	B4	2.881	B4	-0.625	B4	-6.104	C5	3.698	C5	-01.68	C5	-15.022	C5	-11.98									D5	21.035	D5	15.43	D5	-2.592	D5	-03.66
G4	19.069	G4	17.979	G4	10.54	G4	03.33	B4	15.765	B4	-5.259	B4	-7.664	B4	-11.037	Bb4	12.258	Bb4	4.243	Bb4	3.844	Bb4	-14.702	G4	30.659	G4	8.155	G4	0.695	G4	7.800	C#5	28.950	C#5	23.98	C#5	6.245	C#5	8.031
G4	14.269	G4	18.218	G4	1.769	G4	0.124	A4	13.219	A4	-1.359	A4	-10.023	A4	-2.417	Bb4	2.519	Bb4	0.566	Bb4	-13.814	Bb4	-19.366	G4	5.766	G4	5.606	G4	9.047	G4	-1.835	B4	17.685	B4	8.706	B4	07.61	B4	-02.42
F#4	9.313	F#4	8.499	F#4	00.63	F#4	10.75	A4	9.612	A4	5.898	A4	-4.100	A4	-4.121	A4	-0.647	A4	14.956	A4	-12.045	A4	-6.439	F#4	21.912	F#4	5.911	F#4	08.60	F#4	14.01	A4	32.260	A4	3.820	A4	04.80	A4	-07.88
F#4	30.249	F#4	18.920	F#4	0.856	F#4	7.487	A4	13.322	A4	04.25	A4	00.59	A4	01.53	A4	18.627	A4	14.629	A4	-8.143	A4	3.155	E4	29.508	E4	4.962	E4	-03.43	E4	31.72	D5	28.985	D5	28.519	D5	4.950	D5	-3.150
E4	10.122	E4	4.702	E4	5.323	E4	4.530	D5	19.229	D5	16.83	D5	11.74	D5	08.18	G4	21.612	G4	6.116	G4	7.648	G4	2.472	A4	13.913	A4	22.733	A4	12.107	A4	-6.462	G4	18.904	G4	9.071	G4	-3.861	G4	-2.647
E4	13.471	E4	21.981	E4	13.091	E4	14.036									G4	16.555	G4	-1.131	G4	-0.666	G4	13.639	A4	18.936	A4	10.347	A4	4.581	A4	1.623	F#4	13.376	F#4	3.834	F#4	-3.507	F#4	0.770
F#4	9.304	F#4	0.431	F#4	1.159	F#4	-0.433									G4	28.091	G4	12.282	G4	14.036	G4	4.720									E4	9.416	E4	2.940	E4	-8.113	E4	03.09
F#4	11.407	F#4	-6.928	F#4	4.348	F#4	-0.956	C#4	14.330	C#4	25.26	C#4	07.81	C#4	09.34	Bb4	18.997	Bb4	0.687	Bb4	-14.400	Bb4	-15.137																
G4	12.407	G4	-0.239	G4	-0.200	G4	-4.121	B4	15.508	B4	8.672	B4	-7.097	B4	-10.310	A4	17.502	A4	9.452	A4	-11.364	A4	-4.235									E4	17.535	E4	14.901	E4	-2.997	E4	-06.83
G4	7.731	G4	-3.393	G4	-1.994	G4	-3.342	A4	10.998	A4	2.532	A4	-3.803	A4	0.587	G4	12.289	G4	-5.370	G4	-21.792	G4	-16.188									D4	-0.435	D4	1.936	D4	7.080	D4	14.100
G4	17.799	G4	5.300	G4	1.748	G4	-3.968	A4	19.040	A4	-1.547	A4	-2.696	A4	1.129	G4	7.340	G4	-6.549	G4	-14.259	G4	-8.705	G4	12.304	G4	5.459	G4	-01.41	G4	17.63								
F#4	13.031	F#4	18.613	F#4	06.71	F#4	07.92	G#4	19.555	G#4	07.83	G#4	05.45	G#4	16.85	F4	6.072	F4	-0.011	F4	-17.170	F4	-1.991	A4	20.019	A4	16.692	A4	3.858	A4	5.786								
F#4	13.482	F#4	7.861	F#4	1.256	F#4	-3.202	G#4	26.467	G#4	12.729	G#4	7.092	G#4	11.083	E4	15.132	E4	6.462	E4	-12.11	E4	-02.46	B4	33.819	B4	8.236	B4	-0.168	B4	8.576								
E4	10.248	E4	9.682	E4	-4.070	E4	2.620	A4	12.684	A4	13.041	A4	-7.898	A4	0.913	F4	26.170	F4	9.813	F4	-10.997	F4	-1.403	F#4	8.115	F#4	-4.190	F#4	2.105	F#4	1.298								
																E4	3.294	E4	5.767	E4	-8.318	E4	-4.077	E4	9.182	E4	3.531	E4	10.35	E4	15.776								
																								F#4	20.865	F#4	11.059	F#4	09.16	F#4	08.59								
																								G4	15.259	G4	9.577	G4	-12.859	G4	-2.091								

9.3 – THE BBC SINGERS SOPRANO SECTION'S AVERAGE DEVIATIONS

Ave Verum Corpus_Tuning Table — The BBC Singers_Alto Section Average Deviations

Difference in Cents from Equal Temperament

Phrases																															
First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Alto I		Alto II		Alto III		Alto IV		Alto I		Alto II		Alto III		Alto IV		Alto I		Alto II		Alto III		Alto IV		Alto I		Alto II		Alto III		Alto IV		Alto I		Alto II		Alto III		Alto IV	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
F#4	1.088	F#4	-1.022	F#4	13.469	F#4	-2.799	E4	6.609	E4	-9.988	E4	4.159	E4	-7.293	E4	16.630	E4	6.098	E4	20.051	E4	15.537	D4	9.824	D4	1.152	D4	10.30	D4	-02.05								
F#4	1.352	F#4	-7.403	F#4	7.239	F#4	-0.362	E4	-12.544	E4	-0.504	E4	5.031	E4	-13.832	E4	14.518	E4	6.640	E4	15.106	E4	1.015	D4	9.985	D4	16.219	D4	06.73	D4	-00.87								
								E4	3.406	E4	-4.862	E4	5.055	E4	-7.991	E4	12.121	E4	-0.587	E4	4.398	E4	-3.865	D4	11.439	D4	11.135	D4	11.678	D4	-6.399	F#4	06.21	F#4	7.201	F#4	27.869	F#4	15.803
E4	8.610	E4	-6.472	E4	10.338	E4	-6.053																	C#4	24.789	C#4	4.605	C#4	18.26	C#4	-03.93	G4	-09.11	G4	-1.037	G4	9.024	G4	1.563
								E4	12.385	E4	-2.910	E4	15.893	E4	3.072	E4	14.301	E4	6.112	E4	8.600	E4	7.901	B3	31.289	B3	3.589	B3	11.47	B3	-02.56	F#4	1.431	F#4	-4.249	F#4	12.060	F#4	9.438
E4	0.698	E4	-4.535	E4	5.074	E4	-5.558	E4	21.714	E4	9.328	E4	18.231	E4	12.40									E4	10.267	E4	11.415	E4	14.570	E4	7.195	E4	6.072	E4	3.151	E4	16.240	E4	0.494
E4	-1.068	E4	1.515	E4	7.929	E4	-11.565									E4	-7.478	E4	-4.074	E4	0.693	E4	1.459	E4	3.514	E4	-0.772	E4	8.391	E4	-3.994								
G4	-5.634	G4	-8.260	G4	20.36	G4	-01.58																																
F#4	5.827	F#4	0.669	F#4	22.470	F#4	3.369	G#4	-0.984	G#4	3.570	G#4	23.922	G#4	4.025																								
E4	-1.513	E4	-0.115	E4	21.62	E4	-04.91	G#4	8.348	G#4	5.630	G#4	16.757	G#4	1.498	E4	-6.924	E4	-7.894	E4	1.588	E4	-7.537	E4	3.340	E4	2.081	E4	13.166	E4	-5.798								
E4	-5.245	E4	1.086	E4	13.530	E4	-7.961	A4	-2.486	A4	-16.458	A4	10.645	A4	1.472	E4	2.456	E4	-10.351	E4	3.819	E4	-3.904	E4	-2.096	E4	-6.890	E4	5.088	E4	-9.752	D4	5.579	D4	-11.301	D4	18.43	D4	-04.62
D4	2.264	D4	2.202	D4	11.97	D4	-08.72	A4	3.241	A4	-11.386	A4	3.302	A4	10.256	F4	-13.535	F4	-33.424	F4	-4.642	F4	-10.029	D4	10.635	D4	-9.885	D4	16.52	D4	-12.54	C#4	1.230	C#4	6.816	C#4	26.27	C#4	01.57
D4	17.241	D4	-11.042	D4	10.860	D4	-3.669									F4	5.077	F4	-16.288	F4	0.274	F4	0.377	C#4	28.935	C#4	9.754	C#4	26.79	C#4	-00.75	D4	25.821	D4	11.585	D4	14.202	D4	1.946
C#4	15.078	C#4	-15.992	C#4	10.884	C#4	-8.989									D4	10.613	D4	-1.190	D4	13.362	D4	-7.557	F#4	10.549	F#4	6.225	F#4	19.916	F#4	-3.468	D4	20.096	D4	8.316	D4	16.955	D4	0.717
C#4	14.642	C#4	-0.624	C#4	13.335	C#4	-7.470	G#4	-02.72	G#4	-3.627	G#4	30.341	G#4	12.752	D4	13.364	D4	12.984	D4	9.583	D4	-8.019	F#4	-2.042	F#4	-5.005	F#4	13.503	F#4	2.833	D4	12.185	D4	6.069	D4	13.503	D4	-1.226
D4	3.867	D4	-4.708	D4	3.722	D4	-12.549	A4	06.32	A4	-2.469	A4	20.248	A4	16.685	E4	14.519	E4	-1.025	E4	10.969	E4	-2.187									C#4	12.714	C#4	-9.637	C#4	22.179	C#4	-04.60
D4	14.607	D4	0.505	D4	6.844	D4	-12.130									F4	12.237	F4	-4.240	F4	14.826	F4	-3.452																
E4	-4.232	E4	3.575	E4	9.046	E4	1.393	F#4	4.881	F#4	-5.555	F#4	4.210	F#4	-4.404	E4	5.609	E4	13.351	E4	12.092	E4	-1.256									C#4	12.153	C#4	8.015	C#4	28.933	C#4	-01.66
E4	-15.196	E4	-4.971	E4	11.068	E4	-8.990	F#4	12.219	F#4	-2.215	F#4	8.146	F#4	-3.352	E4	-5.672	E4	6.256	E4	2.334	E4	-14.530									D4	4.820	D4	-0.766	D4	15.182	D4	-7.167
E4	1.208	E4	2.645	E4	14.094	E4	-3.845	E4	3.128	E4	-0.058	E4	8.075	E4	-1.049	E4	-4.655	E4	-0.184	E4	-0.694	E4	-9.590	G4	-0.358	G4	-14.453	G4	10.66	G4	-03.45								
D4	5.185	D4	14.092	D4	15.75	D4	-13.70									D4	-2.198	D4	2.570	D4	7.800	D4	-14.104	F#4	-1.145	F#4	-7.066	F#4	26.011	F#4	1.683								
D4	17.490	D4	13.938	D4	15.740	D4	-6.075	E4	5.467	E4	1.151	E4	13.018	E4	1.371	C#4	16.762	C#4	20.473	C#4	23.11	C#4	02.82	E4	-21.343	E4	-1.352	E4	7.226	E4	-16.705								
C#4	11.915	C#4	-10.382	C#4	11.715	C#4	-6.565	E4	2.975	E4	2.522	E4	3.840	E4	-7.735	D4	7.267	D4	9.180	D4	11.684	D4	-5.902	D4	6.566	D4	3.243	D4	11.611	D4	-13.597								
																C#4	6.648	C#4	-3.635	C#4	11.979	C#4	-13.472	C#4	7.983	C#4	-2.946	C#4	15.40	C#4	-7.860								
																								C#4	17.344	C#4	7.523	C#4	23.55	C#4	-03.79								
																								D4	3.394	D4	-14.810	D4	11.971	D4	-11.739								

9.4 – The BBC Singers alto section's average deviations

Ave Verum Corpus_Tuning Table — The BBC Singers_Tenor Section Average Deviations

Difference in Cents from Equal Temperament

Phrases																															
First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Tenor I		Tenor II		Tenor III		Tenor IV		Tenor I		Tenor II		Tenor III		Tenor IV		Tenor I		Tenor II		Tenor III		Tenor IV		Tenor I		Tenor II		Tenor III		Tenor IV		Tenor I		Tenor II		Tenor III		Tenor IV	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
A3	12.599	A3	-0.992	A3	-25.495	A3	7.144	C#4	-9.028	C#4	-11.322	C#4	-20.067	C#4	-5.326	C#4	14.597	C#4	8.863	C#4	1.682	C#4	15.569																
A3	10.870	A3	6.449	A3	-29.407	A3	6.421	C#4	-5.019	C#4	-6.476	C#4	-18.369	C#4	-4.412	C#4	1.815	C#4	7.675	C#4	-11.799	C#4	0.602																
								C#4	-6.006	C#4	-2.336	C#4	-17.114	C#4	0.081	C#4	1.784	C#4	-6.706	C#4	-21.104	C#4	-8.912	B3	7.504	B3	-0.873	B3	-16.679	B3	-7.471	C4	02.17	C4	11.032	C4	12.925	C4	16.504
B3	-2.935	B3	-2.568	B3	-14.550	B3	-6.349	D4	-5.407	D4	-05.72	D4	-29.049	D4	-3.558																					D4	02.76	D4	9.013	D4	-3.322	D4	9.315
								D4	0.394	D4	1.045	D4	-10.618	D4	2.032	C#4	2.744	C#4	2.599	C#4	-7.232	C#4	7.293															C4	3.035	C4	0.848	C4	-0.677	C4	13.627
B3	-7.345	B3	-3.019	B3	-20.183	B3	-2.436	B3	-4.296	B3	6.719	B3	-6.080	B3	09.76	C4	09.61	C4	03.35	C4	-8.022	C4	09.50	B3	4.726	B3	-2.842	B3	-15.855	B3	-4.485	B3	10.967	B3	9.947	B3	0.138	B3	7.634
A3	14.573	A3	3.130	A3	-22.870	A3	-2.132									C4	-5.582	C4	-11.275	C4	-25.203	C4	-2.385	B3	9.647	B3	-3.002	B3	-16.157	B3	-3.163	D4	-7.946	D4	-09.90	D4	-20.022	D4	-02.74
																Bb3	-4.778	Bb3	-24.03	Bb3	-29.738	Bb3	-19.45	A3	06.34	A3	-06.58	A3	-27.756	A3	-4.117	C#4	-11.043	C#4	02.31	C#4	-12.964	C#4	-01.26
A3	13.781	A3	6.489	A3	-15.043	A3	3.685	D4	-16.049	D4	-9.788	D4	-27.630	D4	-10.975	A3	-3.284	A3	-09.30	A3	-31.637	A3	-21.49	G3	17.13	G3	02.75	G3	-10.536	G3	11.154	B3	-3.124	B3	01.96	B3	-11.242	B3	-07.29
								D4	-15.049	D4	-8.601	D4	-20.422	D4	-3.052	G3	-0.649	G3	-12.437	G3	-31.207	G3	-25.382	C#4	9.702	C#4	4.921	C#4	-15.276	C#4	19.571	A3	7.844	A3	02.22	A3	-23.032	A3	-4.624
A3	9.697	A3	0.793	A3	-12.381	A3	6.634	C#4	-10.759	C#4	-7.084	C#4	-23.632	C#4	-8.557	G3	-4.275	G3	-7.672	G3	-25.654	G3	-27.478	C#4	-5.124	C#4	-8.216	C#4	-22.664	C#4	-4.548								
								C#4	-11.202	C#4	-1.602	C#4	-14.572	C#4	9.930	A3	-0.011	A3	-16.065	A3	-26.239	A3	-20.690																
A3	8.088	A3	7.156	A3	5.113	A3	18.537									A3	4.036	A3	0.381	A3	-10.168	A3	-2.225									A3	0.639	A3	6.398	A3	-5.318	A3	25.750
A3	14.389	A3	0.990	A3	-9.895	A3	3.163									B3	6.810	B3	5.835	B3	6.249	B3	10.278	C#4	6.055	C#4	3.382	C#4	-13.473	C#4	10.004	G3	17.857	G3	-5.110	G3	-1.384	G3	-6.013
A3	11.638	A3	8.888	A3	-6.731	A3	0.625	D4	-02.20	D4	-5.635	D4	-9.657	D4	-8.313	B3	3.551	B3	-5.549	B3	-13.271	B3	0.442	C#4	-0.829	C#4	-9.491	C#4	-18.668	C#4	-8.006	A3	7.004	A3	4.536	A3	-8.656	A3	2.951
A3	19.224	A3	4.900	A3	-9.753	A3	-2.626	E4	-03.03	E4	7.976	E4	-15.883	E4	16.098	C#4	3.497	C#4	3.692	C#4	4.056	C#4	-2.514	B3	-03.08	B3	-05.78	B3	-16.782	B3	-2.052	G3	-2.375	G3	1.317	G3	-19.425	G3	01.67
A3	13.924	A3	5.519	A3	-6.506	A3	0.961									D4	-1.890	D4	-0.529	D4	-11.815	D4	-9.921	A3	19.84	A3	09.51	A3	-12.598	A3	15.881								
A3	11.159	A3	9.295	A3	2.603	A3	16.626	D4	-3.327	D4	-0.387	D4	-17.632	D4	-3.188	E4	5.189	E4	-6.998	E4	-3.395	E4	-4.213	D4	09.45	D4	06.11	D4	-9.668	D4	10.936	G3	-4.707	G3	8.344	G3	1.091	G3	18.72
A3	3.904	A3	-1.893	A3	-11.303	A3	-0.151	C#4	-1.143	C#4	-2.495	C#4	-14.101	C#4	-4.497	C#4	-4.210	C#4	-10.940	C#4	1.020	C#4	2.109	D4	-04.40	D4	-03.46	D4	-12.380	D4	-6.586	F#3	13.420	F#3	4.552	F#3	-2.846	F#3	14.839
A3	8.218	A3	12.316	A3	2.487	A3	15.368	B3	-1.584	B3	1.073	B3	-11.818	B3	-1.272	C#4	-4.753	C#4	-4.653	C#4	-13.057	C#4	-12.391																
																D4	-10.054	D4	-6.460	D4	-26.764	D4	-21.887	D4	13.736	D4	26.387	D4	10.049	D4	18.484								
A3	8.734	A3	15.199	A3	-2.223	A3	12.300	B3	7.974	B3	7.386	B3	-0.869	B3	16.921									D4	8.321	D4	16.212	D4	-5.400	D4	-2.472								
A3	8.239	A3	2.202	A3	-10.049	A3	6.007	C#4	-6.254	C#4	-5.580	C#4	-11.045	C#4	5.390	B3	-9.320	B3	6.361	B3	-5.597	B3	-2.581	A3	6.680	A3	0.465	A3	-11.837	A3	3.397								
																E3	-8.655	E3	-8.901	E3	-21.815	E3	-7.238																
																								A3	00.49	A3	01.90	A3	-9.980	A3	11.53								
																								G3	7.378	G3	-0.875	G3	-25.816	G3	-1.960								

9.5 – The BBC Singers tenor section's average deviations

Ave Verum Corpus_Tuning Table — The BBC Singers_Bass Section Average Deviations

Difference in Cents from Equal Temperament

Phrases																															
First Phrase								Second Phrase								Third Phrase								Fourth Phrase								Fifth Phrase							
Bass I		Bass II		Bass III		Bass IV		Bass I		Bass II		Bass III		Bass IV		Bass I		Bass II		Bass III		Bass IV		Bass I		Bass II		Bass III		Bass IV		Bass I		Bass II		Bass III		Bass IV	
Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents	Notes	Cents
D3	-12.136	D3	-7.759	D3	-4.483	D3	0.617	A3	6.279	A3	-11.469	A3	-0.733	A3	5.122	A3	10.407	A3	6.544	A3	13.123	A3	26.380																
D3	-19.464	D3	-6.365	D3	9.816	D3	9.202	A3	5.903	A3	-8.679	A3	-3.158	A3	3.467	A3	17.857	A3	0.917	A3	8.850	A3	16.336																
								A3	-1.897	A3	-0.455	A3	-1.397	A3	12.245	A3	0.247	A3	-1.535	A3	-10.671	A3	5.503	G3	-2.639	G3	-15.001	G3	-21.857	G3	-8.842	A3	04.54	A3	4.050	A3	-1.970	A3	15.929
D3	-18.988	D3	-12.055	D3	-1.575	D3	1.195	B3	4.980	B3	-10.71	B3	-21.192	B3	30.705	G3	-3.672	G3	-16.68	G3	-11.17	G3	-1.221															Bb3	-02.00	Bb3	2.560	Bb3	-18.053	Bb3	7.241
								B3	21.089	B3	-2.594	B3	5.277	B3	41.691	G3	14.924	G3	-6.938	G3	-4.893	G3	6.650															A3	2.373	A3	-2.207	A3	-14.974	A3	6.638
D3	-9.642	D3	-13.699	D3	-2.726	D3	-2.550																	G3	11.033	G3	6.520	G3	-5.087	G3	-1.251	G#3	-1.509	G#3	-9.134	G#3	-18.478	G#3	17.734
C#3	-17.754	C#3	-2.236	C#3	7.641	C#3	19.346									C3	-31.390	C3	-14.009	C3	-14.765	C3	-15.470	G3	8.313	G3	-2.362	G3	-11.312	G3	-3.293								
								E3	01.70	E3	-07.53	E3	-13.72	E3	12.875									F#3	-02.48	F#3	-06.10	F#3	-1.759	F#3	-3.930								
C#3	-1.821	C#3	-1.778	C#3	20.514	C#3	27.193	E3	-16.629	E3	-2.750	E3	7.342	E3	-11.816									E3	02.81	E3	07.69	E3	10.173	E3	8.953								
								E#3	-25.605	E#3	-18.055	E#3	-13.136	E#3	5.511	C3	-25.688	C3	-16.965	C3	-15.644	C3	0.919	A3	15.754	A3	5.088	A3	3.140	A3	14.511	G3	5.136	G3	-11.49	G3	-13.952	G3	5.821
D3	-20.241	D3	-15.902	D3	-0.624	D3	13.726	F#3	-15.607	F#3	-26.199	F#3	-18.332	F#3	-1.334	C3	-16.236	C3	-7.641	C3	-11.110	C3	-8.854	A3	7.202	A3	-15.039	A3	-9.868	A3	-0.383								
								F#3	11.243	F#3	-13.433	F#3	-3.253	F#3	10.409	F3	-15.589	F3	-14.634	F3	-12.851	F3	0.762																
D3	-4.193	D3	-4.131	D3	6.222	D3	26.374									F3	21.042	F3	-0.024	F3	15.847	F3	43.463									F#3	23.868	F#3	16.402	F#3	16.189	F#3	20.259
A2	-9.917	A2	-10.518	A2	-3.711	A2	-0.800									F3	3.643	F3	-8.369	F3	10.207	F3	14.218	A3	8.547	A3	-6.719	A3	-10.272	A3	8.125	B2	7.775	B2	-6.153	B2	-12.937	B2	3.663
A2	6.977	A2	9.415	A2	12.593	A2	-6.951	B2	-00.84	B2	-16.538	B2	-8.143	B2	-5.287	F3	-10.850	F3	-22.324	F3	-7.859	F3	-2.535	A3	1.602	A3	-14.983	A3	-24.652	A3	-5.153	A2	-5.782	A2	-4.841	A2	-12.442	A2	-2.517
D3	-14.928	D3	-6.045	D3	-2.707	D3	22.377	C#3	-11.09	C#3	-0.726	C#3	12.408	C#3	24.964	E3	-5.517	E3	-1.298	E3	10.977	E3	3.215	G3	03.82	G3	-15.08	G3	-23.342	G3	-17.195								
D3	-18.746	D3	-8.293	D3	-8.818	D3	1.816									D3	-26.416	D3	2.365	D3	-2.936	D3	0.657	F#3	-00.64	F#3	04.58	F#3	3.819	F#3	20.715	A2	02.38	A2	-01.24	A2	-16.18	A2	-1.182
C#3	4.650	C#3	13.314	C#3	26.782	C#3	30.719	D3	-9.945	D3	-6.029	D3	2.029	D3	8.726	C#3	-6.108	C#3	2.644	C#3	7.432	C#3	8.704	B3	08.92	B3	-05.41	B3	-11.064	B3	12.342								
C#3	-4.520	C#3	-0.514	C#3	10.565	C#3	17.195	D3	-3.394	D3	-0.299	D3	3.882	D3	-1.494	A2	6.508	A2	-19.080	A2	-14.246	A2	-36.061	B3	07.56	B3	-10.87	B3	-19.259	B3	7.246	D3	1.834	D3	-1.169	D3	-0.433	D3	4.715
D3	6.052	D3	4.990	D3	15.168	D3	25.510	E3	-8.155	E3	-7.649	E3	2.690	E3	8.144	Bb2	4.543	Bb2	-12.445	Bb2	-18.418	Bb2	-6.012																
																A2	-17.396	A2	-5.676	A2	-12.692	A2	-15.257	A3	24.118	A3	11.090	A3	6.855	A3	19.779								
D3	1.872	D3	7.969	D3	4.584	D3	23.279	E3	6.109	E3	2.144	E3	8.110	E3	9.545									G#3	4.906	G#3	0.284	G#3	-2.201	G#3	9.932								
A2	-5.655	A2	-6.655	A2	-5.500	A2	-4.042	A2	-0.156	A2	-5.913	A2	-3.462	A2	-6.508	G#2	7.487	G#2	9.475	G#2	6.516	G#2	2.704	A3	4.279	A3	-8.775	A3	-6.031	A3	14.302								
																A2	-19.452	A2	-13.934	A2	-10.980	A2	1.634	A2	-9.578	A2	-9.241	A2	-21.07	A2	-9.601								
																								B2	-5.318	B2	-14.157	B2	-13.337	B2	2.572								

9.6 – The BBC Singers basses section's average deviations

APPENDIX 10

10 - MEASUREMENTS RESULTS
– ROYAL ACADEMY OF MUSIC SINGING QUARTET –

10 – Measurements results – Royal Academy of Music singing quartet

AVC _ Worksheet _ RAM Quartet Recording Session _ Overview

Reference Frequencies with Thirds										Frequency Measurements										Reference Frequencies without Thirds					
Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5		Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5		Phrase 1		Phrase 2		Phrase 3	
146.740	D	109.624	A	109.628	A	145.099	D	144.617	D	146.326	D	109.612	A	109.482	A	144.736	D	144.660	D						

First Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
SOPRANO tk 01	442.070	596.287	369.606	438.526	414.789	387.731	389.487	498.228	440.956	389.891	401.003	372.818	383.301	326.720	336.239	374.706	370.372	389.703	387.747	390.876	372.130	369.178	330.010
SOPRANO tk 02	438.799	587.356	370.255	447.161	416.917	388.814	389.333	490.246	436.858	391.164	397.057	368.669	377.571	329.694	327.664	368.040	368.698	387.467	389.639	390.984	371.083	368.491	329.419
SOPRANO tk 03	437.713	599.516	370.179	440.022	417.330	389.833	388.533	490.570	438.099	385.480	388.909	367.565	376.346	328.447	333.466	371.930	369.408	393.539	389.137	391.234	372.287	367.459	328.500
SOPRANO tk 04	442.250	589.277	370.459	439.604	419.338	392.012	388.411	490.091	438.258	387.454	393.939	369.357	372.773	324.524	328.369	370.176	368.857	390.728	386.988	388.489	366.163	362.657	327.242
SOPRANO tk 05	436.781	586.154	370.070	441.103	416.771	395.122	389.409	491.263	440.642	392.451	395.701	370.942	376.609	330.434	336.391	373.076	372.726	393.542	390.301	391.697	365.521	370.330	328.066
SOPRANO tk 06	442.963	587.611	365.556	437.066	417.698	394.127	397.700	499.826	446.500	392.945	397.876	374.197	378.210	323.341	336.049	375.456	375.555	390.871	389.928	393.695	376.592	372.809	334.296
SOPRANO tk 07	438.190	587.038	371.775	446.905	416.705	388.492	386.415	492.034	435.970	388.066	390.216	366.226	372.271	333.298	325.929	375.348	376.181	387.193	390.515	390.980	363.089	366.046	326.829
SOPRANO tk 08	439.165	584.536	371.145	449.402	415.234	390.207	391.919	495.805	438.553	391.471	393.151	367.899	373.159	331.737	326.988	373.392	370.990	386.584	384.032	386.696	368.401	364.891	330.210
SOPRANO tk 09	438.628	581.645	368.713	435.793	410.960	390.030	385.948	492.970	439.876	391.571	395.516	368.488	377.766	327.785	333.577	377.262	372.745	390.922	388.135	392.212	371.173	370.186	323.515
SOPRANO tk 10	448.181	589.281	366.189	441.159	418.440	383.688	383.162	486.461	431.696	381.959	380.298	361.778	367.065	327.776	321.898	366.912	366.912	382.538	381.452	382.582	363.919	360.138	322.626
SOPRANO tk 11	440.578	587.839	364.463	446.630	417.799	391.102	387.428	491.537	440.767	396.575	397.877	374.410	372.726	329.119	331.966	372.218	370.493	392.962	387.001	392.085	366.397	367.931	332.156
SOPRANO tk 12	441.864	583.988	371.173	444.109	417.066	391.991	390.041	493.459	441.678	390.701	394.375	372.383	375.829	328.166	336.963	372.528	371.297	396.904	392.422	394.786	373.057	370.609	328.604
SOPRANO Average	440.599	588.377	369.132	442.290	416.587	390.263	388.982	492.707	439.154	389.977	393.826	369.561	375.302	328.420	331.292	372.587	371.186	390.246	388.108	390.526	369.151	367.560	328.456
Cents RF+3rds	3.440	4.172	-2.955	10.073	6.424	-6.585	-12.273	-3.041	-2.244	-7.850	9.153	-0.943	25.745	-5.267	9.804	13.175	6.653	-6.658	-16.169	-5.415	-2.865	-10.341	-5.077
Cents RF-3rds	8.333	9.065	1.938	14.966	11.317	-1.691	-7.380	1.853	2.649	-2.957	14.047	3.950	30.638	-0.374	14.697	18.069	11.546	-1.764	-11.276	-0.521	2.029	-5.448	-0.184
Just Int I	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Just Int II	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Pythagorean	1.955	0.000	7.820	1.955	11.730	-1.955	-1.955	5.865	1.955	-1.955	-1.955	7.820	7.820	3.910	3.910	7.820	7.820	-1.955	-1.955	-1.955	7.820	7.820	3.910
Meantone	-3.421	0.000	-13.686	-3.421	-20.530	3.422	3.422	-10.264	-3.421	3.422	3.422	-13.686	-13.686	-6.843	-6.843	-13.686	-13.686	3.422	3.422	3.422	-13.686	-13.686	-6.843
ALTO tk 01	366.282	368.724	326.040	327.888	327.790	392.000	370.922	328.125	329.931	293.903	294.559	277.293	276.056	291.074	291.829	330.662	332.152	333.509	294.880	295.064	278.047		
ALTO tk 02	369.736	369.680	327.190	328.512	329.573	392.473	372.545	332.574	331.991	292.704	294.616	275.621	277.630	296.123	295.246	330.624	329.394	330.320	295.210	294.999	278.423		
ALTO tk 03	369.063	368.708	331.728	329.360	333.732	391.528	372.053	330.527	327.898	293.556	295.612	275.392	278.593	294.277	295.718	330.012	331.216	330.575	295.687	297.004	277.782		
ALTO tk 04	368.765	369.200	329.059	329.314	329.043	387.853	368.361	330.412	331.750	293.419	295.922	275.401	277.525	295.156	291.489	331.137	327.942	331.080	295.063	291.906	275.335		
ALTO tk 05	366.908	369.987	331.735	330.745	330.191	390.520	371.494	335.813	332.263	292.164	293.490	275.684	278.768	296.070	287.724	331.215	329.246	329.990	296.494	294.955	275.921		
ALTO tk 06	370.022	370.626	330.251	328.734	330.394	392.461	373.019	326.667	332.838	293.732	295.385	274.490	277.248	293.339	292.485	334.397	326.141	332.816	294.374	295.293	277.077		
ALTO tk 07	372.505	372.816	329.221	329.069	327.811	392.283	373.209	330.177	331.161	294.789	295.480	275.341	276.966	292.856	293.665	331.001	329.238	331.176	295.102	292.600	276.687		
ALTO tk 08	368.784	368.651	329.159	328.001	328.539	389.446	370.111	331.153	335.817	295.085	295.799	276.987	275.320	293.609	294.705	332.565	328.975	331.031	294.674	292.451	277.311		
ALTO tk 09	370.650	369.266	330.054	328.936	329.666	387.909	373.178	332.584	331.248	292.693	295.262	275.771	277.982	296.716	294.295	332.752	326.335	330.621	292.518	292.619	274.581		
ALTO tk 10	368.431	366.744	330.305	327.025	328.773	386.568	367.443	326.555	328.530	291.070	292.370	272.501	272.674	291.975	294.105	328.420	328.352	328.012	291.294	289.030	271.241		
ALTO tk 11	367.500	368.638	327.331	327.162	326.946	388.878	369.092	324.873	328.836	292.053	294.559	275.185	275.887	293.931	293.270	330.885	326.089	330.415	292.505	293.012	275.652		
ALTO tk 12	366.916	366.851	328.692	328.812	328.195	389.216	372.450	332.042	333.198	293.660	296.049	277.866	278.259	295.671	296.199	335.707	331.269	332.779	295.030	296.010	275.981		
ALTO Average	368.797	369.158	329.230	328.630	329.221	390.095	371.156	330.125	331.288	293.236	294.925	275.628	276.909	294.233	293.394	331.615	328.862	331.027	294.403	293.745	276.170		
Cents RF+3rds	-4.527	-2.835	-1.001	-4.162	-1.051	-7.330	6.514	3.697	9.787	-1.445	8.501	-8.654	-0.624	4.432	-0.511	11.492	-2.938	8.421	5.430	1.560	-5.252		

Cents RF-3rds	0.367	2.059	3.893	0.731	3.842	-2.436	11.408	8.591	14.680	3.448	13.394	-3.761	4.270	9.326	4.383	16.386	1.955	13.314	10.324	6.454	-0.358
Just Int I	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731
Just Int II	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731
Pythagorean	7.820	7.820	3.910	3.910	3.910	-1.955	7.820	3.910	3.910	0.000	0.000	9.775	9.775	0.000	0.000	3.910	3.910	3.910	0.000	0.000	9.775
Meantone	-13.686	-13.686	-6.843	-6.843	-6.843	3.422	-13.686	-6.843	-6.843	0.000	0.000	-17.108	-17.108	0.000	0.000	-6.843	-6.843	-6.843	0.000	0.000	-17.108
TENOR tk 01	221.327	219.985	244.950	242.765	217.751	218.761	219.455	218.875	219.315	220.843	220.951	220.544	219.717	219.419	218.639	220.307	219.716				
TENOR tk 02	220.214	219.282	245.479	244.618	219.313	220.131	220.432	219.455	219.388	220.500	219.896	219.035	219.573	218.667	219.027	220.157	219.918				
TENOR tk 03	223.273	220.931	245.645	242.717	219.504	219.159	218.480	220.583	219.642	221.425	220.877	218.946	219.127	218.948	219.076	219.667	219.612				
TENOR tk 04	219.576	219.339	243.640	243.180	219.856	219.418	218.233	219.900	217.872	219.894	218.853	218.278	218.761	216.620	218.139	219.550	217.995				
TENOR tk 05	220.288	219.460	245.006	242.945	219.279	218.639	218.800	219.665	218.884	220.005	218.584	218.159	219.007	218.540	218.915	220.253	218.712				
TENOR tk 06	221.491	220.451	245.360	243.329	220.254	220.171	220.165	220.583	219.707	220.500	221.742	220.140	221.234	219.561	219.690	221.430	219.571				
TENOR tk 07	221.449	219.978	245.116	244.010	219.521	220.440	218.876	219.603	218.829	221.238	222.440	220.423	220.921	219.366	219.301	218.901	220.190				
TENOR tk 08	220.590	219.766	243.453	243.060	217.051	217.107	218.246	220.368	218.688	220.143	218.736	218.919	217.087	218.977	217.828	219.098	218.439				
TENOR tk 09	219.165	217.850	243.107	241.265	217.438	218.845	217.805	220.057	218.681	220.765	221.414	218.746	218.746	218.683	219.470	218.951	217.912				
TENOR tk 10	216.340	217.908	240.769	241.074	216.852	216.268	215.400	217.914	214.619	215.508	217.816	215.368	216.214	214.494	215.776	216.665	214.941				
TENOR tk 11	220.825	219.147	245.071	242.029	218.525	218.176	218.534	219.990	218.913	219.672	219.369	219.664	220.158	218.768	218.578	218.189	218.562				
TENOR tk 12	220.020	220.174	243.386	242.150	219.286	218.180	219.890	218.996	220.812	220.716	221.596	222.446	220.269	220.557	220.201	220.668	220.493				
TENOR Average	220.380	219.522	244.248	242.762	218.719	218.775	218.693	219.666	218.779	220.101	220.189	219.222	219.235	218.550	218.720	219.486	218.838				
Cents RF+3rds	4.071	-2.676	-17.899	-28.468	-9.023	-8.585	-9.229	-1.547	-8.548	1.879	2.575	-5.044	-4.948	-10.362	-9.015	-2.961	-8.079				
Cents RF-3rds	8.965	2.217	-13.005	-23.575	-4.130	-3.691	-4.336	3.346	-3.654	6.772	7.468	-0.151	-0.054	-5.469	-4.121	1.932	-3.185				
Just Int I	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995				
Just Int II	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995				
Pythagorean	1.955	1.955	5.865	5.865	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955				
Meantone	-3.421	-3.421	-10.264	-10.264	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421				
BASS tk 01	146.841	146.066	145.462	146.605	136.565	137.486	145.580	146.569	110.403	109.490	144.496	145.425	138.807	135.495	146.431	147.384	109.487				
BASS tk 02	146.853	147.288	145.023	146.500	137.521	138.114	145.760	145.728	109.794	110.230	145.395	144.764	138.619	136.380	146.427	146.009	110.331				
BASS tk 03	148.070	147.700	146.379	147.024	137.693	137.416	145.831	145.792	110.073	108.595	146.177	147.000	138.086	139.238	147.106	147.851	110.053				
BASS tk 04	146.977	146.400	145.680	147.257	139.610	138.273	144.842	144.564	109.357	109.124	145.885	144.330	136.972	137.408	146.311	146.624	109.648				
BASS tk 05	146.599	147.594	145.174	145.664	138.609	138.200	145.646	145.627	109.182	111.773	145.870	145.213	136.682	138.506	146.915	145.987	109.558				
BASS tk 06	147.333	147.374	146.708	147.106	137.928	138.022	146.812	147.475	109.433	109.929	144.926	145.436	139.005	138.420	147.130	146.730	110.004				
BASS tk 07	147.965	146.269	146.930	148.213	137.154	139.514	145.680	146.859	109.509	109.793	146.398	146.801	138.306	138.171	146.702	146.661	109.574				
BASS tk 08	145.317	145.467	145.925	145.731	136.624	137.477	144.306	145.827	109.075	109.962	144.780	145.208	136.198	137.442	145.817	145.907	109.142				
BASS tk 09	145.566	147.055	145.739	145.467	137.963	138.939	144.412	145.560	109.474	110.518	147.214	146.265	137.718	136.406	146.501	146.729	109.402				
BASS tk 10	146.346	147.041	145.647	144.917	135.629	136.639	144.721	143.821	107.254	108.194	144.140	144.703	135.566	135.748	144.704	142.349	108.384				
BASS tk 11	146.785	147.773	146.593	146.741	139.251	140.105	145.295	145.670	109.724	109.895	146.677	144.998	139.157	138.028	146.355	145.703	109.814				
BASS tk 12	145.487	144.235	145.035	144.408	137.048	138.896	145.394	144.936	110.552	111.929	146.990	147.260	140.092	138.279	146.438	147.048	110.126				
BASS Average	146.678	146.589	145.858	146.303	137.633	138.257	145.357	145.702	109.486	109.953	145.741	145.617	137.934	137.460	146.403	146.249	109.627				
Cents RF+3rds	-0.731	-0.611	-10.442	-5.170	-10.928	-3.098	-16.402	-12.289	-7.025	0.340	-11.836	-13.304	-7.144	-13.104	-3.983	-5.810	-4.796				
Cents RF-3rds	4.162	4.282	-5.548	-0.276	-6.035	1.795	-11.508	-7.396	-2.132	5.233	-6.942	-8.411	-2.250	-8.210	0.911	-0.917	0.097				
Just Int I	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995				
Just Int II	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995				
Pythagorean	0.000	0.000	0.000	0.000	9.775	9.775	0.000	0.000	1.955	1.955	0.000	0.000	9.775	9.775	0.000	0.000	1.955				

Meantone	0.000	0.000	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421	-3.421	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421			
Second Phrase																				
	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
SOPRANO tk 01	325.312	438.606	448.292	416.422	421.285	322.070	415.015	495.194	496.822	442.112	436.978	444.173	592.892	555.034	488.805	436.239	443.672	416.678	418.748	439.405
SOPRANO tk 02	323.624	438.495	446.451	419.725	417.529	331.540	414.917	496.073	494.195	440.686	435.049	436.106	589.993	554.162	494.752	438.159	444.619	418.845	419.625	440.488
SOPRANO tk 03	325.568	442.150	445.976	418.324	417.669	332.496	414.859	497.762	495.523	439.655	441.436	443.216	587.146	554.729	492.249	440.708	439.970	420.345	417.870	442.677
SOPRANO tk 04	329.142	438.487	435.972	413.864	418.059	330.893	414.457	493.217	489.578	436.976	436.654	436.332	586.780	556.320	490.929	440.749	439.596	415.943	413.942	438.213
SOPRANO tk 05	327.298	434.574	436.670	415.990	414.647	333.298	414.164	490.376	490.200	435.630	437.622	437.346	587.793	559.412	492.399	434.565	436.945	416.020	414.615	440.097
SOPRANO tk 06	329.576	446.172	440.945	421.379	420.979	332.706	415.633	496.737	492.883	439.845	436.080	443.026	594.859	557.012	502.522	442.343	443.303	415.011	417.805	444.338
SOPRANO tk 07	323.665	440.530	440.562	415.349	415.192	323.961	411.553	492.094	491.806	439.901	434.993	442.660	586.029	547.472	489.031	432.024	436.986	417.537	418.506	439.852
SOPRANO tk 08	323.134	438.230	438.668	414.944	414.382	329.843	412.757	491.639	489.808	438.873	429.992	436.295	592.724	553.587	491.540	440.208	439.667	422.064	416.324	442.162
SOPRANO tk 09	330.730	439.063	435.081	411.875	414.464	336.618	417.092	493.475	490.147	435.411	436.634	439.153	585.407	553.766	486.127	432.878	433.103	413.473	417.005	438.374
SOPRANO tk 10	314.072	436.219	436.818	409.779	417.949	325.243	408.119	489.751	491.272	431.003	431.722	435.675	582.330	540.802	488.071	434.367	434.935	411.875	413.503	435.888
SOPRANO tk 11	329.213	442.186	439.066	414.152	417.264	327.340	418.584	493.985	489.286	436.427	436.427	445.157	586.045	560.232	497.446	440.142	441.009	417.575	417.918	443.451
SOPRANO tk 12	332.259	443.863	443.406	421.875	424.094	330.246	415.122	501.888	497.939	441.967	441.566	441.566	589.900	556.000	496.082	434.454	439.669	418.605	424.068	441.479
SOPRANO Average	326.133	439.881	440.659	416.140	417.793	329.688	414.356	494.349	492.455	438.207	436.263	440.059	588.491	554.044	492.496	437.236	439.456	416.998	417.494	440.535
Cents RF+3rds	-12.530	5.454	8.512	9.400	16.263	6.238	1.963	7.554	0.908	-1.147	-8.846	6.153	9.343	4.919	1.053	-4.987	3.782	12.964	15.025	8.027
Cents RF-3rds	-12.340	5.645	8.703	9.591	16.453	6.428	2.153	7.745	1.098	-0.957	-8.656	6.343	9.533	5.109	1.243	-4.796	3.972	13.155	15.215	8.217
Just Int I	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	-44.860	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Just Int II	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	3.910	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	1.955	0.000	0.000	9.775	9.775	1.955	9.775	3.910	3.910	0.000	0.000	0.000	-1.955	7.820	3.910	0.000	0.000	9.775	9.775	0.000
Meantone	-3.421	0.000	0.000	-17.108	-17.108	-3.421	-17.108	-6.843	-6.843	0.000	0.000	0.000	3.422	-13.686	-6.843	0.000	0.000	-17.108	-17.108	0.000
ALTO tk 01	328.902	327.230	327.147	331.188	332.162	414.515	412.484	437.507	434.822	416.679	442.697	369.384	368.830	329.959	330.985	330.847				
ALTO tk 02	327.342	327.979	326.117	330.368	330.830	410.946	412.364	438.561	444.768	415.283	437.008	368.591	365.771	326.098	327.852	330.691				
ALTO tk 03	330.030	328.596	328.600	330.282	332.869	411.056	410.213	437.700	439.082	412.240	436.758	369.960	368.000	327.674	330.473	331.655				
ALTO tk 04	329.968	330.280	327.770	328.185	330.612	407.703	406.579	434.980	440.567	415.661	439.303	368.773	369.324	328.135	329.789	330.413				
ALTO tk 05	329.844	325.684	324.997	329.369	331.573	408.022	406.862	436.471	439.261	414.956	439.011	369.497	368.448	328.150	329.972	331.535				
ALTO tk 06	332.171	329.373	330.071	333.811	334.672	418.792	416.378	434.900	436.734	415.639	443.192	373.546	371.878	328.346	333.085	331.850				
ALTO tk 07	328.335	325.777	327.684	329.710	329.421	414.479	415.039	435.947	438.408	411.436	434.767	364.932	364.294	325.677	328.089	329.803				
ALTO tk 08	330.227	326.743	327.314	329.360	332.537	413.939	411.777	437.287	437.546	414.346	440.796	366.749	367.686	328.140	330.350	332.202				
ALTO tk 09	328.867	327.796	326.433	330.961	331.507	407.956	409.403	435.639	438.203	412.521	436.599	365.028	366.200	326.227	327.210	327.912				
ALTO tk 10	325.299	324.438	325.056	328.079	327.341	411.800	410.932	431.807	436.082	410.263	435.167	367.220	363.017	324.216	329.343	327.000				
ALTO tk 11	327.075	327.866	324.674	329.052	329.165	410.508	407.875	438.404	439.950	415.061	440.230	368.990	366.505	325.231	327.656	327.827				
ALTO tk 12	332.403	330.952	330.390	335.642	334.706	417.064	410.270	440.892	441.112	418.592	442.967	371.174	369.302	328.008	331.509	330.406				
ALTO Average	329.205	327.726	327.188	330.501	331.450	412.232	410.848	436.675	438.878	414.390	439.041	368.654	367.438	327.155	329.693	330.178				
Cents RF+3rds	3.703	-4.093	-6.940	10.501	15.466	-6.936	-12.756	-7.212	1.502	2.104	2.145	-0.363	-6.082	-7.112	6.264	8.812				
Cents RF-3rds	3.893	-3.903	-6.750	10.691	15.656	-6.746	-12.566	-7.022	1.692	2.294	2.336	-0.173	-5.891	-6.922	6.454	9.003				
Just Int I	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995				
Just Int II	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995				
Pythagorean	1.955	1.955	1.955	1.955	1.955	9.775	9.775	0.000	0.000	9.775	0.000	5.865	5.865	1.955	1.955	1.955				
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-17.108	-17.108	0.000	0.000	-17.108	0.000	-10.264	-10.264	-3.421	-3.421	-3.421				
TENOR tk 01	273.836	275.243	275.037	291.014	292.756	245.008	291.801	290.340	274.025	276.936	292.978	329.410	293.546	273.656	243.910	245.730	274.097			

TENOR tk 02	273.961	276.047	275.143	292.396	293.431	246.009	292.390	290.676	276.009	275.716	292.674	328.528	292.481	272.125	245.213	245.015	274.828
TENOR tk 03	275.337	276.316	276.270	293.713	292.027	245.548	290.392	289.070	275.649	274.526	291.261	327.943	291.207	272.902	244.677	245.605	274.975
TENOR tk 04	273.611	273.488	273.710	290.685	290.754	245.387	289.775	288.066	272.723	274.479	289.542	327.730	290.318	272.643	243.128	243.823	274.050
TENOR tk 05	275.361	272.976	274.502	291.067	291.891	246.040	289.806	288.236	273.273	273.295	289.896	328.825	290.660	272.491	245.033	245.121	274.093
TENOR tk 06	277.257	276.588	277.474	290.922	292.599	247.771	290.714	290.378	273.868	274.441	291.454	326.857	289.240	275.625	245.677	246.960	275.179
TENOR tk 07	274.922	273.957	275.646	292.674	292.728	244.467	290.821	289.275	274.482	273.139	289.574	326.534	290.726	271.586	243.531	242.941	273.539
TENOR tk 08	273.748	273.743	275.215	288.653	290.152	244.782	289.297	287.989	272.988	271.216	290.738	327.114	291.077	273.836	244.553	245.177	274.427
TENOR tk 09	272.977	272.975	273.536	290.933	291.433	245.241	288.994	287.694	272.748	272.050	290.528	327.945	288.896	271.268	243.002	243.789	272.313
TENOR tk 10	271.210	270.598	273.392	286.627	286.459	243.683	286.621	285.167	269.685	269.984	288.061	326.335	287.339	271.526	242.251	243.118	271.104
TENOR tk 11	274.081	273.000	273.537	290.614	290.172	245.021	289.113	286.556	274.042	273.906	289.841	327.691	289.696	271.364	243.805	244.356	274.188
TENOR tk 12	275.211	276.980	276.435	291.181	292.882	248.190	292.405	291.173	275.130	275.796	293.639	326.903	293.447	275.625	245.387	246.810	275.325
TENOR Average	274.292	274.326	274.991	290.873	291.440	245.596	290.177	288.718	273.719	273.790	290.849	327.651	290.720	272.887	244.180	244.871	274.010
Cents RF+3rds	-12.224	-12.013	-7.819	-10.614	-7.242	-3.541	-14.760	-23.488	-15.850	-15.396	-10.759	-4.489	-11.528	-21.116	-13.545	-8.659	-14.008
Cents RF-3rds	-12.034	-11.823	-7.629	-10.423	-7.051	-3.351	-14.569	-23.298	-15.660	-15.206	-10.569	-4.299	-11.338	-20.926	-13.355	-8.469	-13.818
Just Int I	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-8.731	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686
Just Int II	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-29.219	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686
Pythagorean	7.820	7.820	7.820	-1.955	-1.955	3.910	-1.955	-1.955	7.820	7.820	-1.955	1.955	-1.955	7.820	3.910	3.910	7.820
Meantone	-13.686	-13.686	-13.686	3.422	3.422	-6.843	3.422	3.422	-13.686	-13.686	3.422	-3.421	3.422	-13.686	-6.843	-6.843	-13.686
BASS tk 01	219.063	220.115	219.245	243.606	247.005	161.941	164.696	172.997	185.674	184.851	122.740	136.199	144.858	145.102	163.737	164.620	110.492
BASS tk 02	219.943	220.732	220.651	244.609	245.527	165.406	166.598	174.748	183.768	185.922	120.705	137.809	145.763	145.104	164.383	164.890	109.961
BASS tk 03	220.535	220.133	219.450	242.858	246.819	164.123	164.829	173.205	184.288	184.328	121.057	137.253	145.726	144.024	163.733	164.697	108.953
BASS tk 04	217.960	218.825	218.393	243.100	245.911	164.680	164.679	173.258	182.539	182.763	119.823	135.671	144.701	144.551	163.357	164.589	109.609
BASS tk 05	218.994	218.943	218.317	240.861	244.839	162.003	163.600	173.416	181.777	183.192	121.218	137.579	145.653	145.764	163.851	165.257	109.882
BASS tk 06	220.711	220.511	221.037	243.779	247.877	164.314	165.221	173.669	184.530	184.699	121.115	138.287	145.733	145.652	164.887	165.789	110.302
BASS tk 07	219.230	218.958	218.748	243.424	244.375	162.326	163.538	170.798	182.755	183.459	119.756	138.588	146.057	146.122	163.243	164.330	109.332
BASS tk 08	219.230	219.033	219.244	242.101	245.006	163.090	164.612	170.288	184.058	182.442	119.764	138.016	145.785	144.557	164.027	164.863	109.509
BASS tk 09	218.336	218.373	218.766	242.122	243.572	164.580	165.160	172.934	181.983	181.434	119.469	138.076	144.772	143.908	162.786	163.714	109.322
BASS tk 10	215.482	215.938	216.563	239.095	243.449	159.152	159.937	169.126	179.393	181.282	119.043	138.258	143.912	143.393	161.920	163.167	107.393
BASS tk 11	218.040	216.671	218.142	241.304	242.299	163.441	163.481	172.332	180.901	182.189	121.436	139.678	145.031	143.608	163.440	164.587	109.534
BASS tk 12	219.970	221.250	221.146	245.786	249.048	166.738	167.206	176.194	184.810	185.697	121.780	139.722	145.883	146.410	164.775	165.722	110.381
BASS Average	218.958	219.124	219.142	242.720	245.477	163.483	164.463	172.747	183.040	183.521	120.659	137.928	145.156	144.850	163.678	164.685	109.556
Cents RF+3rds	-2.300	-0.989	-0.844	-23.928	-4.375	-8.114	2.233	-12.688	-12.495	-7.945	-33.963	-2.383	-13.956	-17.616	-6.047	4.572	-1.084
Cents RF-3rds	-2.110	-0.799	-0.654	-23.738	-4.185	-7.924	2.423	-12.498	-12.304	-7.754	-33.772	-2.193	-13.766	-17.425	-5.857	4.762	-0.894
Just Int I	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000
Just Int II	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000
Pythagorean	0.000	0.000	0.000	3.910	3.910	1.955	1.955	15.640	5.865	5.865	3.910	7.820	-1.955	-1.955	1.955	1.955	0.000
Meantone	0.000	0.000	0.000	-6.843	-6.843	-3.421	-3.421	-27.373	-10.264	-10.264	-6.843	-13.686	3.422	3.422	-3.421	-3.421	0.000

Third Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
SOPRANO tk 01	438.996	436.133	437.665	461.098	464.941	461.349	584.596	514.931	462.774	463.265	430.297	432.846	386.933	384.370	386.254	457.571	438.297	381.668	388.748	348.287	326.278	351.129	329.402
SOPRANO tk 02	441.897	441.839	444.953	461.618	460.766	461.912	580.540	518.845	458.698	469.648	431.583	439.218	386.477	382.044	386.625	458.560	431.495	385.391	384.250	343.293	322.390	348.091	326.810
SOPRANO tk 03	439.995	440.100	442.134	456.385	461.384	460.443	579.040	519.042	461.384	465.640	433.868	436.634	389.025	385.186	386.940	453.037	430.575	376.344	384.149	345.431	322.655	349.352	330.877

SOPRANO tk 04	441.489	440.281	438.591	457.153	459.406	459.107	575.137	520.767	455.600	456.332	428.632	433.309	386.876	385.838	388.048	453.903	434.738	386.316	388.705	345.493	325.977	350.269	326.661
SOPRANO tk 05	444.125	440.428	442.357	457.152	461.167	464.150	574.661	519.336	462.702	461.935	434.934	434.714	387.422	385.542	388.492	457.080	432.694	387.698	388.621	349.812	322.112	348.922	324.297
SOPRANO tk 06	444.322	444.030	447.608	463.614	466.418	467.237	582.811	518.052	465.732	468.846	438.482	439.540	384.573	394.010	385.300	460.053	436.229	392.023	390.073	351.415	334.743	354.283	332.640
SOPRANO tk 07	439.684	435.665	440.574	455.893	458.049	461.364	581.569	513.837	455.849	457.928	429.059	432.442	384.861	384.010	387.421	450.094	424.506	389.882	383.784	341.377	326.264	342.019	325.577
SOPRANO tk 08	442.483	441.756	441.623	462.025	461.317	463.779	581.624	521.209	465.353	464.432	442.711	439.348	388.149	384.727	389.432	456.052	433.474	382.801	384.835	343.719	326.879	348.158	328.248
SOPRANO tk 09	437.546	434.729	437.841	457.628	460.287	463.153	576.063	514.408	458.692	455.223	432.423	433.905	388.697	387.025	387.623	459.856	438.686	386.625	385.749	345.206	329.596	347.929	326.596
SOPRANO tk 10	434.567	430.900	435.819	452.226	451.122	454.639	575.435	514.991	456.242	459.996	431.898	436.078	382.490	381.954	383.029	454.987	434.227	386.534	384.065	342.719	328.260	340.219	322.494
SOPRANO tk 11	441.740	441.511	441.000	457.715	462.730	466.515	562.007	516.287	455.789	453.255	432.587	436.569	391.390	386.218	388.132	457.048	440.217	382.291	384.352	339.448	325.578	345.616	326.740
SOPRANO tk 12	441.707	442.485	442.513	464.750	466.399	465.919	581.946	520.852	467.148	465.602	443.272	447.330	390.830	391.528	391.126	462.789	439.340	384.986	386.588	344.531	326.524	347.588	325.988
SOPRANO Average	440.712	439.155	441.057	458.938	461.165	462.464	577.952	517.713	460.497	461.842	434.146	436.828	387.310	386.038	387.368	456.752	434.540	385.213	386.160	345.061	326.438	347.798	327.194
Cents RF+3rds	8.672	2.542	10.024	-21.173	-12.792	-7.924	-21.992	-12.550	-15.303	-10.255	-17.318	-6.656	-14.946	-20.643	-14.685	-29.438	-15.747	-24.344	-20.094	-14.911	-10.962	-1.234	-6.957
Cents RF-3rds	10.966	4.836	12.318	-18.879	-10.498	-5.630	-19.698	-10.256	-13.009	-7.961	-15.024	-4.362	-12.652	-18.349	-12.391	-27.144	-13.453	-22.050	-17.800	-12.617	-8.668	1.060	-4.663
Just Int I	0.000	0.000	0.000	4.955	4.955	-37.039	-1.955	7.820	-37.039	-37.039	-21.506	-21.506	-25.416	-25.416	-52.680	-9.774	-21.506	-52.680	-52.680	-7.820	-19.551	-14.596	-19.551
Just Int II	0.000	0.000	0.000	4.955	4.955	-15.532	19.551	29.326	-15.532	-15.532	0.000	0.000	-3.910	-3.910	-31.174	11.732	0.000	-31.174	-31.174	13.686	1.955	6.910	1.955
Pythagorean	0.000	0.000	0.000	-9.775	-9.775	-9.775	-1.955	-5.865	-9.775	-9.775	0.000	0.000	-3.910	-3.910	-3.910	-9.775	0.000	-3.910	-3.910	-7.820	1.955	-7.820	1.955
Meantone	0.000	0.000	0.000	17.107	17.107	17.107	3.422	10.265	17.107	17.107	0.000	0.000	6.843	6.843	6.843	17.107	0.000	6.843	6.843	13.686	1.955	13.686	1.955
ALTO tk 01	331.760	332.128	330.410	330.306	328.138	327.895	330.579	346.399	347.111	292.132	291.403	325.447	339.989	329.221	324.512	320.286	293.615	273.933	290.903	276.202			
ALTO tk 02	332.449	331.191	331.274	331.129	328.160	328.828	328.481	345.622	347.998	293.654	293.561	329.308	342.878	332.219	325.721	328.845	296.253	278.862	292.939	278.038			
ALTO tk 03	331.631	330.124	327.432	329.699	328.499	327.303	326.371	345.932	347.078	293.025	294.687	327.156	346.221	334.421	329.789	326.150	292.247	277.497	292.233	277.551			
ALTO tk 04	331.452	329.237	328.323	328.900	327.108	326.302	326.954	342.627	345.239	292.176	292.248	324.545	346.989	334.091	328.198	325.859	293.326	282.005	292.393	275.006			
ALTO tk 05	332.336	329.707	330.511	331.367	326.471	326.186	326.596	342.388	345.454	289.524	292.720	329.364	346.698	327.039	329.132	327.993	290.441	273.850	291.221	275.285			
ALTO tk 06	333.790	334.878	331.629	332.127	329.188	330.194	326.799	343.820	346.159	296.657	294.922	327.912	346.392	329.624	329.596	327.027	290.378	274.027	291.632	276.527			
ALTO tk 07	329.832	329.259	324.837	325.629	324.380	326.131	325.304	343.070	344.113	288.462	293.515	330.463	348.250	327.256	322.574	324.204	287.137	273.973	289.741	274.803			
ALTO tk 08	333.362	332.711	330.344	331.333	326.546	325.263	325.838	344.755	348.175	288.755	292.813	329.104	346.718	326.385	324.283	326.020	293.561	277.144	291.198	276.014			
ALTO tk 09	330.081	330.415	329.563	327.934	326.102	326.957	324.802	339.504	343.336	289.775	290.769	323.366	342.157	332.460	326.314	325.766	290.648	275.100	290.314	274.612			
ALTO tk 10	326.024	327.357	330.060	326.229	323.475	322.532	323.637	339.855	341.028	283.184	284.382	317.070	339.934	323.986	318.247	319.329	288.103	269.692	287.696	272.570			
ALTO tk 11	324.846	329.370	324.095	325.588	323.396	324.734	323.676	340.162	342.863	290.358	290.469	326.311	343.390	330.419	328.348	323.984	287.461	272.673	291.757	274.663			
ALTO tk 12	333.392	333.077	330.975	332.654	326.578	325.494	329.858	344.854	347.788	294.798	291.198	330.976	348.444	334.762	327.277	326.973	291.552	274.545	292.511	277.527			
ALTO Average	330.913	330.788	329.121	329.408	326.503	326.485	326.575	343.249	345.528	291.042	291.891	326.752	344.838	330.157	326.166	325.203	291.227	275.275	291.211	275.733			
Cents RF+3rds	12.609	11.954	3.209	4.717	-10.616	-10.712	-10.238	-24.027	-12.568	-9.662	-4.620	-9.298	-16.029	8.651	-12.406	-17.525	-8.562	-6.084	-8.653	-3.205			
Cents RF-3rds	14.903	14.248	5.503	7.011	-8.322	-8.418	-7.944	-21.732	-10.274	-7.368	-2.326	-7.004	-13.735	10.945	-10.112	-15.231	-6.268	-3.790	-6.359	-0.911			
Just Int I	1.955	1.955	1.955	1.955	-19.552	-19.552	-19.552	-7.819	-7.819	-23.461	-23.461	-19.551	-7.820	-19.551	-19.551	-19.551	-23.461	-35.192	-50.725	-35.192			
Just Int II	1.955	1.955	1.955	1.955	1.954	1.954	1.954	13.687	13.687	-1.955	-1.955	1.955	13.686	1.955	1.955	1.955	-1.955	-13.686	-29.219	-13.686			
Pythagorean	1.955	1.955	1.955	1.955	1.955	1.955	1.955	-7.820	-7.820	-1.955	-1.955	1.955	-7.820	1.955	1.955	1.955	-1.955	7.820	-1.955	7.820			
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	13.686	13.686	3.422	3.422	-3.421	13.686	-3.421	-3.421	-3.421	3.422	-13.686	3.422	-13.686			
TENOR tk 01	275.911	275.949	272.040	272.070	260.724	257.833	227.175	215.706	195.036	192.967	217.213	217.761	245.566	244.100	270.740	293.474	325.132	273.513	269.936	289.798	243.173	163.401	
TENOR tk 02	275.696	276.231	273.331	274.679	262.304	258.064	227.399	219.122	194.758	192.963	217.565	218.666	246.529	244.576	275.396	289.157	324.219	273.530	273.143	288.997	242.749	161.848	
TENOR tk 03	275.847	275.550	272.729	273.851	260.360	258.735	227.387	217.761	193.436	192.382	216.590	218.085	244.057	244.873	274.648	291.394	327.894	273.524	273.027	289.611	244.440	163.445	
TENOR tk 04	273.648	273.972	271.250	272.303	258.831	257.487	227.545	215.225	192.450	191.838	215.299	215.352	246.506	243.563	273.462	291.444	326.194	272.630	272.712	290.313	244.139	162.574	
TENOR tk 05	273.624	271.962	272.358	272.556	259.179	257.871	227.583	215.702	193.812	192.173	215.166	216.256	245.432	242.321	273.697	289.360	324.882	272.684	271.979	288.537	243.220	161.937	
TENOR tk 06	276.503	275.303	273.758	273.339	261.507	259.024	226.334	217.241	194.941	191.925	217.694	217.305	245.010	244.859	272.616	290.697	325.598	273.393	271.790	288.971	242.611	162.871	
TENOR tk 07	273.750	273.651	270.914	272.759	259.360	256.106	225.892	216.244	192.523	190.405	214.643	217.204	245.113	241.833	272.412	289.638	325.340	272.389	270.913	288.796	242.451	162.017	

TENOR tk 08	274.054	274.287	271.977	271.663	260.289	258.148	228.134	215.787	192.710	193.463	215.615	219.147	246.664	245.213	272.758	288.017	327.678	273.444	271.029	287.956	243.052	162.417
TENOR tk 09	272.599	273.537	269.832	269.894	257.754	253.910	226.430	215.364	191.073	191.966	215.139	215.442	243.014	241.313	272.327	289.415	323.490	274.485	272.232	288.760	243.518	162.106
TENOR tk 10	273.674	270.116	270.336	270.601	259.371	255.037	225.922	213.259	190.767	191.130	212.535	214.611	241.253	240.701	270.982	288.155	321.158	269.920	266.986	284.237	241.066	160.387
TENOR tk 11	274.078	272.060	270.832	269.292	257.388	254.872	225.859	214.598	191.638	192.080	215.149	215.439	244.843	242.828	275.367	291.478	324.898	276.868	273.827	289.212	245.341	163.374
TENOR tk 12	275.603	273.997	272.218	272.365	259.886	260.595	230.351	217.241	193.272	195.574	217.018	218.010	245.925	245.886	274.924	292.142	325.728	273.704	272.178	291.559	243.516	164.446
TENOR Average	274.582	273.885	271.798	272.114	259.746	257.307	227.168	216.104	193.035	192.405	215.802	216.940	244.993	243.506	273.277	290.364	325.184	273.340	271.646	288.896	243.273	162.569
Cents RF+3rds	-10.447	-14.851	-28.092	-26.077	-6.611	-22.945	-38.625	-25.059	-20.501	-26.154	-27.482	-18.379	-7.846	-18.387	-18.694	-13.697	-17.624	-18.296	-29.058	-22.474	-20.041	-17.874
Cents RF-3rds	-8.153	-12.557	-25.798	-23.783	-4.317	-20.651	-36.331	-22.765	-18.207	-23.860	-25.188	-16.085	-5.552	-16.093	-16.400	-11.403	-15.330	-16.002	-26.764	-20.180	-17.747	-15.580
Just Int I	-13.686	-13.686	-13.686	-13.686	7.820	7.820	-37.039	-21.506	-3.910	-3.910	-21.506	-21.506	-39.102	-39.102	-35.192	-19.551	-19.551	-35.192	-35.192	-23.461	-17.596	-19.551
Just Int II	-13.686	-13.686	-13.686	-13.686	29.326	29.326	-15.532	0.000	17.596	17.596	0.000	0.000	-17.596	-17.596	-13.686	-1.955	1.955	-13.686	-13.686	-1.955	3.910	1.955
Pythagorean	7.820	7.820	7.820	7.820	-5.865	-5.865	4.955	0.000	-3.910	-3.910	0.000	0.000	3.910	3.910	7.820	-1.955	1.955	7.820	7.820	-1.955	3.910	1.955
Meantone	-13.686	-13.686	-13.686	-13.686	10.265	10.265	17.107	0.000	6.843	6.843	0.000	0.000	-6.843	-6.843	-13.686	3.422	-3.421	-13.686	-13.686	3.422	-6.843	-3.421
BASS tk 01	220.667	222.104	218.029	195.796	196.370	129.415	129.083	130.479	171.112	174.023	173.762	171.271	163.284	143.410	137.420	108.125	115.239	108.677	103.265	108.869		
BASS tk 02	221.425	222.791	220.020	197.190	196.819	130.373	129.576	130.310	173.241	174.495	173.849	172.893	163.180	145.915	137.075	110.026	114.394	110.291	103.053	109.143		
BASS tk 03	220.420	221.499	218.954	196.055	196.886	130.580	128.875	128.859	173.444	175.121	174.891	172.868	164.520	145.781	137.019	109.497	115.440	109.960	103.401	110.526		
BASS tk 04	219.285	217.043	218.116	195.424	196.172	129.483	129.426	129.048	172.191	172.383	173.148	172.862	162.327	145.217	137.177	110.158	114.259	109.497	104.078	109.930		
BASS tk 05	220.089	221.360	218.539	196.307	197.411	129.299	129.216	129.434	171.992	172.800	171.696	171.708	164.249	144.264	137.124	108.697	113.897	109.388	102.287	109.365		
BASS tk 06	220.265	221.813	219.824	195.182	198.343	130.133	128.571	127.988	172.115	174.657	173.386	172.861	163.777	144.850	136.709	107.978	114.981	109.199	102.038	109.079		
BASS tk 07	217.515	218.317	216.783	192.187	193.534	128.853	127.726	128.375	169.396	172.606	171.213	169.589	162.093	146.467	137.797	110.755	114.789	108.185	101.471	108.568		
BASS tk 08	220.286	221.824	217.442	194.118	196.071	129.697	127.359	129.036	171.416	174.217	173.897	171.918	162.426	143.259	135.923	107.141	114.169	108.835	101.361	109.104		
BASS tk 09	218.752	221.644	217.427	194.180	196.018	129.480	127.598	129.177	171.455	174.207	174.046	171.913	162.512	143.492	135.493	107.073	114.106	108.722	101.443	109.104		
BASS tk 10	216.922	217.851	216.056	192.878	193.071	127.676	127.440	127.890	170.306	172.827	172.079	170.699	161.091	141.681	135.836	105.556	112.532	108.206	101.857	107.637		
BASS tk 11	218.618	218.810	215.983	193.321	194.690	129.034	127.781	127.850	170.721	171.777	170.054	171.322	162.232	146.911	137.803	109.086	114.188	108.894	103.090	109.521		
BASS tk 12	220.784	222.160	220.470	197.471	198.301	131.053	129.650	130.400	173.218	174.727	174.246	174.057	166.305	146.083	138.905	108.621	115.415	111.083	102.915	109.258		
BASS Average	219.586	220.601	218.137	195.009	196.140	129.590	128.525	129.070	171.717	173.653	173.022	171.997	163.166	144.778	137.023	108.559	114.451	109.245	102.522	109.175		
Cents RF+3rds	2.608	10.597	-8.853	-2.884	7.132	-10.393	-24.673	-17.342	-23.090	-3.681	-9.983	-20.276	-11.520	-18.527	-13.827	-16.951	-25.460	-6.055	-16.018	-7.155		
Cents RF-3rds	4.902	12.891	-6.559	-0.590	9.426	-8.099	-22.379	-15.048	-20.796	-1.387	-7.689	-17.982	-9.226	-16.233	-11.533	-14.657	-23.166	-3.761	-13.724	-4.861		
Just Int I	0.000	0.000	0.000	-31.174	-31.174	7.820	7.820	7.820	-7.819	-7.819	-56.590	-56.590	-19.551	-19.551	-35.192	-21.506	-16.551	-21.506	-33.237	-21.506		
Just Int II	0.000	0.000	0.000	-31.174	-31.174	29.326	29.326	29.326	13.687	13.687	-35.084	-35.084	1.955	-1.955	-13.686	0.000	4.955	0.000	-11.731	0.000		
Pythagorean	0.000	0.000	0.000	-3.910	-3.910	-5.865	-5.865	-5.865	-7.820	-7.820	-7.820	-7.820	1.955	-1.955	7.820	0.000	-9.775	0.000	9.775	0.000		
Meantone	0.000	0.000	0.000	6.843	6.843	10.265	10.265	10.265	13.686	13.686	13.686	13.686	-3.421	3.422	-13.686	0.000	17.107	0.000	-17.108	0.000		

Fourth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
SOPRANO tk 01	367.159	367.642	367.082	328.723	290.459	383.865	383.771	391.834	385.923	363.281	326.300	430.158	433.251	382.055	434.376	485.539	361.936	327.445	371.546	388.949
SOPRANO tk 02	365.116	368.977	367.649	328.129	294.894	386.080	386.643	391.336	387.508	362.821	328.084	434.483	431.808	381.561	431.617	493.496	365.642	326.227	378.583	390.357
SOPRANO tk 03	365.950	369.178	368.888	331.974	296.134	390.605	388.481	386.594	382.302	364.446	328.416	444.102	435.279	394.066	439.752	487.957	365.524	324.765	366.207	381.379
SOPRANO tk 04	368.236	368.959	366.740	329.365	295.245	389.270	386.683	386.719	381.719	358.038	326.151	439.703	432.022	383.548	431.374	485.993	364.259	325.859	370.316	387.346
SOPRANO tk 05	365.246	361.549	367.102	327.094	293.588	383.726	385.281	385.211	383.823	363.811	328.555	431.427	429.970	380.787	432.934	488.338	358.521	316.179	366.192	378.197
SOPRANO tk 06	371.724	370.457	367.935	329.569	296.688	386.603	383.039	384.985	390.032	367.574	334.520	435.373	436.203	384.118	432.900	489.411	362.973	328.488	375.515	390.035
SOPRANO tk 07	366.692	372.494	366.850	329.439	292.947	390.773	387.058	393.308	386.725	365.851	331.438	434.016	434.278	384.262	429.615	489.621	357.683	326.486	369.986	387.142
SOPRANO tk 08	364.991	367.598	371.250	328.699	290.769	379.986	382.355	385.170	385.478	362.583	324.007	433.318	433.841	386.137	438.989	493.339	360.430	326.511	367.775	389.375
SOPRANO tk 09	365.762	364.164	367.131	328.094	287.529	388.352	384.684	383.743	382.329	361.425	325.365	438.149	431.092	383.362	435.536	487.896	363.179	323.536	370.166	385.945

SOPRANO tk 10	366.143	366.494	366.930	325.406	297.804	384.242	383.834	382.475	380.035	363.143	323.510	436.280	430.622	384.513	429.702	484.687	362.404	320.538	365.497	381.070
SOPRANO tk 11	367.254	368.052	366.323	323.115	293.107	386.378	388.962	387.087	386.380	360.457	321.429	448.751	429.513	386.337	448.751	491.920	366.213	324.190	370.544	388.973
SOPRANO tk 12	366.877	369.858	368.988	328.125	289.543	392.923	391.984	392.529	390.575	368.782	331.051	439.915	434.442	387.121	432.813	491.281	363.545	323.474	366.084	384.833
SOPRANO Average	366.762	367.952	367.739	328.144	293.226	386.900	386.064	387.583	385.236	363.518	327.402	437.140	432.693	384.822	434.863	489.123	362.692	324.475	369.868	386.133
Cents RF+3rds	5.370	10.974	9.973	12.751	17.968	-2.091	-5.835	0.959	-9.555	-10.015	8.832	9.268	-8.432	-11.415	0.229	3.791	-13.949	-6.718	19.965	-5.526
Cents RF-3rds	9.705	15.310	14.309	17.087	22.303	2.244	-1.500	5.295	-5.220	-5.679	13.168	13.603	-4.096	-7.079	4.564	8.127	-9.614	-2.382	24.301	-1.191
Just Int I	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Just Int II	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Pythagorean	7.820	7.820	7.820	3.910	0.000	-1.955	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	-1.955	1.955	5.865	7.820	3.910	7.820	-1.955
Meantone	-13.686	-13.686	-13.686	-6.843	0.000	3.422	3.422	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	3.422	-3.421	-10.264	-13.686	-6.843	-13.686	3.422
ALTO tk 01	292.633	290.198	289.536	274.051	246.953	329.947	327.716	327.436	327.315	295.773	276.709	367.414	368.720	386.863	369.329	328.311	292.653	275.302	276.159	289.778
ALTO tk 02	295.109	295.278	294.485	277.302	250.662	330.838	329.892	329.531	329.017	295.871	281.308	366.977	369.620	388.061	368.470	326.933	290.924	275.673	275.734	291.923
ALTO tk 03	295.397	294.999	293.698	279.088	245.753	333.254	328.413	327.414	325.796	293.480	277.162	367.210	368.019	386.092	371.368	326.388	293.470	272.556	274.728	291.714
ALTO tk 04	294.939	294.561	294.126	278.295	249.186	329.491	329.172	326.881	325.659	291.548	277.979	367.920	366.628	385.394	368.735	326.074	290.939	274.317	278.186	289.942
ALTO tk 05	292.716	292.919	294.900	277.581	244.979	327.814	328.369	328.410	324.460	288.586	270.760	362.434	363.441	382.976	363.292	326.374	288.617	271.505	271.870	287.759
ALTO tk 06	293.400	291.923	294.672	278.509	246.748	328.761	330.555	329.471	326.014	292.231	276.669	364.403	367.926	385.198	364.520	324.450	291.450	275.290	274.749	289.582
ALTO tk 07	293.488	295.698	294.114	277.358	246.949	330.042	328.167	329.382	330.173	294.314	272.966	367.044	369.515	383.842	366.156	322.054	288.163	273.358	275.120	287.639
ALTO tk 08	293.201	290.348	293.045	276.356	245.040	330.899	329.642	329.171	327.774	290.897	276.193	366.596	368.566	385.613	368.625	327.340	288.951	275.175	276.649	290.411
ALTO tk 09	291.801	292.190	290.889	278.281	244.946	328.839	325.884	324.498	323.230	288.892	277.700	364.481	364.076	379.396	364.529	323.704	287.569	272.492	274.529	287.487
ALTO tk 10	288.956	288.617	288.731	269.651	242.198	325.183	323.891	326.169	323.387	289.553	270.552	363.677	365.006	382.630	363.778	321.598	287.396	273.100	272.110	286.914
ALTO tk 11	292.620	292.733	289.668	277.623	244.801	326.517	324.855	323.808	323.807	290.352	275.548	366.352	364.218	382.176	364.096	327.507	289.973	272.160	274.007	289.031
ALTO tk 12	292.131	293.269	292.448	277.680	244.583	329.700	325.993	328.868	326.706	297.987	278.290	370.953	369.119	387.988	369.943	328.012	292.353	275.317	273.379	289.931
ALTO Average	293.033	292.728	292.526	276.815	246.066	329.274	327.712	327.586	326.111	292.457	275.986	366.288	367.071	384.686	366.903	325.729	290.205	273.854	274.768	289.342
Cents RF+3rds	16.828	15.025	13.833	18.260	14.411	18.700	10.471	9.806	1.992	13.425	13.071	3.130	6.827	-12.028	6.035	-0.039	0.040	-0.358	5.414	-5.112
Cents RF-3rds	21.164	19.360	18.169	22.595	18.747	23.035	14.807	14.141	6.328	17.761	17.407	7.466	11.163	-7.693	10.371	4.296	4.376	3.977	9.749	-0.776
Just Int I	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Just Int II	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Pythagorean	0.000	0.000	0.000	9.775	5.865	3.910	3.910	3.910	3.910	0.000	9.775	7.820	7.820	-1.955	7.820	3.910	0.000	9.775	9.775	0.000
Meantone	0.000	0.000	0.000	-17.108	-10.264	-6.843	-6.843	-6.843	-6.843	0.000	-17.108	-13.686	-13.686	3.422	-13.686	-6.843	0.000	-17.108	-17.108	0.000
TENOR tk 01	241.753	241.680	242.456	217.640	197.130	274.021	272.158	275.436	268.940	241.222	218.774	290.258	287.744	290.405	287.754	216.072	215.276	193.888		
TENOR tk 02	241.708	242.017	242.842	217.404	198.539	275.061	272.422	272.836	269.719	241.611	222.098	290.085	290.613	292.676	290.299	217.010	215.617	194.085		
TENOR tk 03	243.633	242.975	244.051	218.292	195.235	273.752	271.850	272.082	271.926	241.808	221.266	291.688	287.876	291.740	290.018	216.389	216.121	193.421		
TENOR tk 04	242.467	241.988	241.890	215.972	194.005	272.292	269.927	271.027	269.370	241.694	219.082	289.458	287.719	290.839	289.191	215.952	214.384	192.378		
TENOR tk 05	244.251	242.129	242.891	217.155	195.175	271.570	270.164	270.321	266.465	240.484	218.175	287.186	287.456	289.536	286.398	213.836	212.953	189.460		
TENOR tk 06	242.912	242.852	241.405	218.481	196.672	271.991	271.926	275.310	269.244	243.301	220.759	290.348	290.007	294.894	289.219	218.382	216.399	193.506		
TENOR tk 07	243.710	241.364	243.688	214.020	195.457	273.503	271.896	271.380	269.867	242.101	219.825	289.235	287.552	289.608	288.384	216.712	214.950	192.001		
TENOR tk 08	241.863	241.043	242.477	215.969	195.216	272.544	270.369	272.706	269.639	240.928	221.136	287.522	286.101	289.117	288.860	216.529	216.294	192.051		
TENOR tk 09	240.860	239.101	241.189	213.767	193.780	270.141	269.483	271.120	268.253	239.481	210.429	286.002	285.021	290.523	284.846	214.013	213.338	189.798		
TENOR tk 10	238.879	238.566	238.890	213.710	192.131	271.939	268.481	270.668	267.672	239.032	218.238	290.323	285.446	286.943	284.287	213.892	214.940	189.645		
TENOR tk 11	242.147	241.291	240.601	215.295	195.193	274.841	272.456	272.647	269.498	242.627	218.011	289.996	287.635	290.218	286.706	216.407	213.551	192.309		
TENOR tk 12	243.378	243.535	242.435	217.911	196.473	272.983	271.082	271.765	269.626	242.373	219.696	286.517	288.495	289.160	287.850	216.247	214.898	193.332		
TENOR Average	242.297	241.545	242.068	216.302	195.417	272.886	271.018	272.275	269.185	241.389	218.958	289.051	287.639	290.472	287.818	215.953	214.893	192.156		

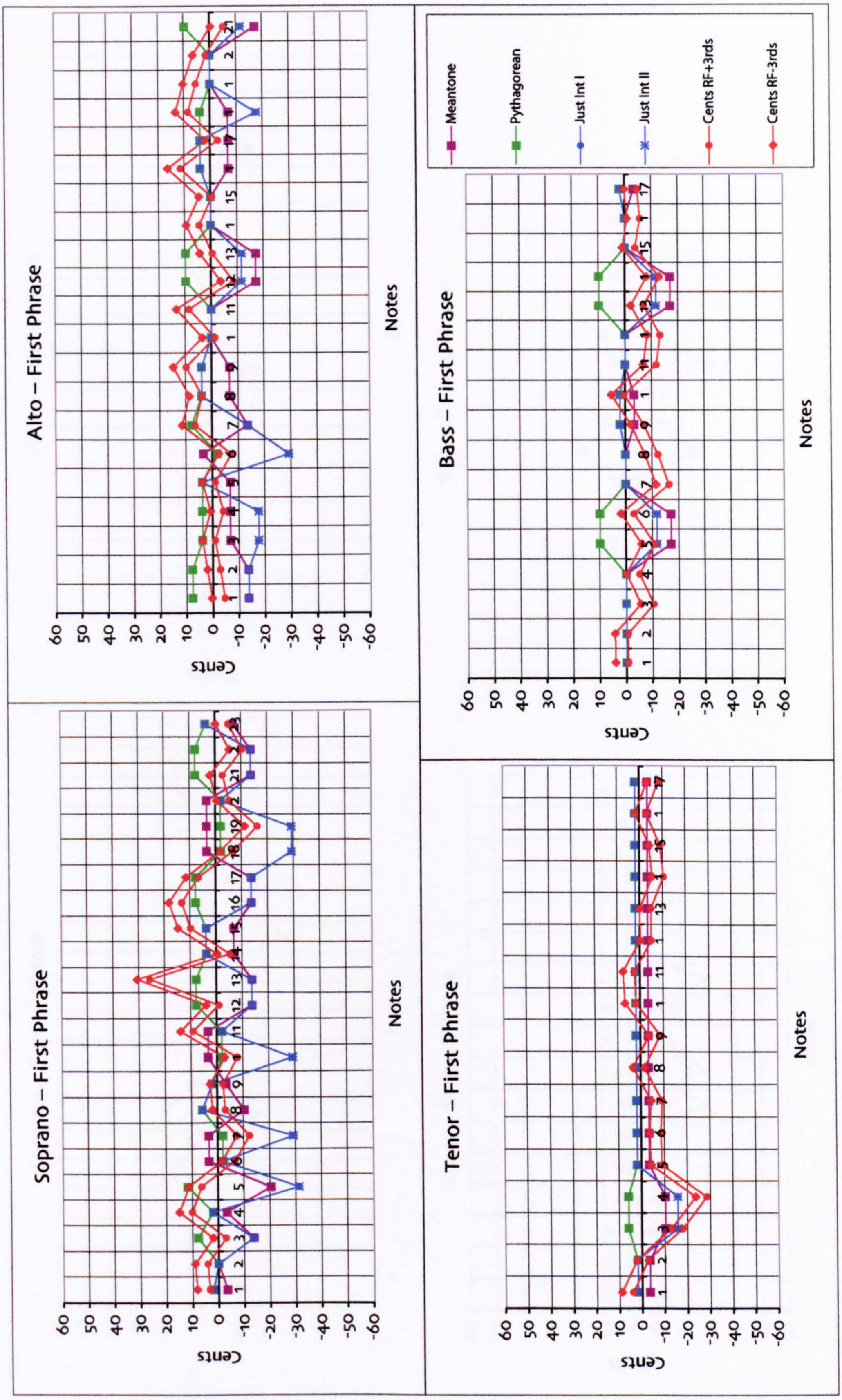
Cents RF+3rds	-12.315	-17.695	-13.951	-8.793	15.424	-6.484	-18.380	-10.369	-30.129	-18.817	12.336	-6.854	-15.336	1.631	-14.259	-11.582	-20.100	-13.711
Cents RF-3rds	-7.979	-13.359	-9.616	-4.457	19.760	-2.149	-14.044	-6.033	-25.793	-14.481	16.672	-2.519	-11.000	5.966	-9.923	-7.247	-15.764	-9.376
Just Int I	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Just Int II	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Pythagorean	5.865	5.865	5.865	1.955	-1.955	9.775	9.775	9.775	9.775	5.865	1.955	0.000	0.000	0.000	0.000	-3.421	-3.421	3.422
Meantone	-10.264	-10.264	-10.264	-3.421	-29.219	-17.108	-17.108	-17.108	-17.108	-10.264	-3.421	0.000	0.000	0.000	0.000	-3.421	-3.421	3.422
BASS tk 01	190.795	192.465	191.688	182.169	163.552	214.983	215.033	216.590	214.162	190.683	182.120	240.450	243.022	216.287	204.213	216.844	109.598	122.924
BASS tk 02	192.182	192.066	193.666	183.770	164.263	216.277	216.648	216.638	214.748	191.323	184.388	242.694	244.513	216.280	205.271	217.463	108.619	123.159
BASS tk 03	193.320	192.993	194.227	184.483	167.207	219.764	216.792	218.489	215.885	193.506	185.118	242.919	244.360	219.908	205.164	217.858	107.891	123.125
BASS tk 04	194.012	193.494	192.469	183.582	163.318	217.381	215.949	217.470	215.359	193.111	182.702	240.427	243.945	217.943	202.342	217.149	109.921	122.716
BASS tk 05	192.483	192.363	193.009	181.265	161.849	214.411	215.052	217.816	214.450	191.564	182.117	241.879	244.424	215.358	201.405	213.520	104.963	120.260
BASS tk 06	194.440	193.648	193.589	184.367	166.206	219.923	218.639	219.611	215.869	192.277	181.692	243.971	244.178	218.084	206.167	217.552	108.913	122.937
BASS tk 07	193.654	193.839	192.364	181.481	166.181	219.723	217.154	218.880	215.681	194.592	184.376	242.553	247.071	219.767	202.875	215.145	107.326	121.978
BASS tk 08	192.917	192.535	190.469	183.995	168.381	215.820	215.501	218.368	215.088	192.668	183.292	241.383	246.752	218.125	201.730	216.296	108.876	121.878
BASS tk 09	192.215	191.176	191.284	183.681	165.409	214.157	214.729	216.323	212.422	189.725	179.329	240.461	241.482	218.295	204.662	215.451	106.622	119.789
BASS tk 10	189.657	190.339	190.131	180.292	161.961	214.703	212.873	213.743	212.964	191.780	179.394	241.505	242.018	214.137	201.901	214.921	106.134	118.919
BASS tk 11	192.449	191.396	191.250	182.670	164.014	212.356	214.325	211.739	216.055	192.161	183.975	241.393	242.468	221.379	203.757	216.926	106.709	120.540
BASS tk 12	193.638	194.260	194.895	184.326	165.662	218.598	217.695	217.557	216.806	193.587	183.772	247.035	242.337	217.282	205.661	216.976	109.098	123.170
BASS Average	192.647	192.548	192.420	183.007	164.834	216.508	215.866	216.935	214.957	192.248	182.690	242.222	243.881	217.737	203.762	216.342	107.889	121.783
Cents RF+3rds	-9.295	-10.186	-11.333	1.831	20.767	-7.142	-12.284	-3.727	-19.585	-12.881	-1.173	-12.847	-1.033	2.658	-12.181	-8.471	-12.987	-3.273
Cents RF-3rds	-4.960	-5.850	-6.997	6.167	25.102	-2.806	-7.948	0.608	-15.249	-8.545	3.163	-8.511	3.303	6.993	-7.845	-4.135	-8.651	1.063
Just Int I	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Just Int II	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Pythagorean	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	1.955	1.955	-1.955	7.820	5.865	5.865	1.955	11.730	1.955	1.955	5.865
Meantone	-29.219	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	-3.421	-3.421	-29.219	-13.686	-10.264	-10.264	-3.421	-20.530	-3.421	3.421	-15.641

Fifth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16
SOPRANO tk 01	388.574	584.277	606.284	659.224	488.799	550.021	585.938	556.510	489.480	438.683	595.120	383.870	363.047	325.622	326.135	294.896
SOPRANO tk 02	387.814	583.292	606.313	656.550	489.658	554.795	586.278	561.065	490.763	439.137	595.685	385.237	364.689	326.439	331.546	295.320
SOPRANO tk 03	387.012	583.205	610.686	659.448	482.070	550.569	584.001	558.160	493.979	436.301	599.359	395.331	368.470	327.325	327.083	290.282
SOPRANO tk 04	388.056	580.075	603.584	655.040	481.752	546.671	577.746	552.793	492.042	429.052	587.380	384.735	360.753	323.830	325.565	289.016
SOPRANO tk 05	385.033	576.973	603.672	651.531	473.833	544.663	572.728	548.377	489.698	428.121	586.515	384.423	359.366	322.517	325.917	289.712
SOPRANO tk 06	389.014	584.607	618.738	658.435	480.045	547.869	577.177	551.683	486.560	434.307	584.875	387.863	363.354	323.922	327.231	290.522
SOPRANO tk 07	382.382	579.745	606.840	661.273	479.517	547.856	581.522	553.056	492.351	439.717	592.797	385.941	363.587	319.495	326.129	292.263
SOPRANO tk 08	387.788	579.080	608.535	657.893	475.348	541.067	572.881	542.167	480.327	422.539	589.278	379.781	360.037	315.192	323.814	287.966
SOPRANO tk 09	385.158	579.438	603.854	648.226	479.032	546.530	574.703	547.630	486.154	422.090	584.567	385.179	360.432	316.552	323.491	287.665
SOPRANO tk 10	382.270	581.332	604.955	660.121	479.109	544.337	575.844	548.689	490.481	429.381	582.500	377.659	360.513	320.303	322.650	289.250
SOPRANO tk 11	390.028	581.496	599.923	646.934	478.719	545.965	576.702	541.827	485.460	429.710	574.833	386.654	364.404	319.983	324.116	291.237
SOPRANO tk 12	388.706	582.272	611.684	659.684	492.002	554.491	586.558	563.501	498.907	430.158	585.719	387.829	365.654	323.301	325.461	290.694
SOPRANO Average	386.820	581.316	607.089	656.197	481.657	547.903	579.340	552.121	489.683	431.600	588.219	385.375	362.859	322.040	325.761	290.735
Cents RF+3rds	3.305	8.499	-16.398	18.265	-17.081	6.016	2.604	19.295	11.531	-7.056	28.936	-3.173	-7.399	-14.000	5.891	8.959
Cents RF-3rds	2.797	7.991	-16.906	17.757	-17.589	5.508	2.096	18.787	11.023	-7.563	28.428	-3.680	-7.906	-14.508	5.383	8.452

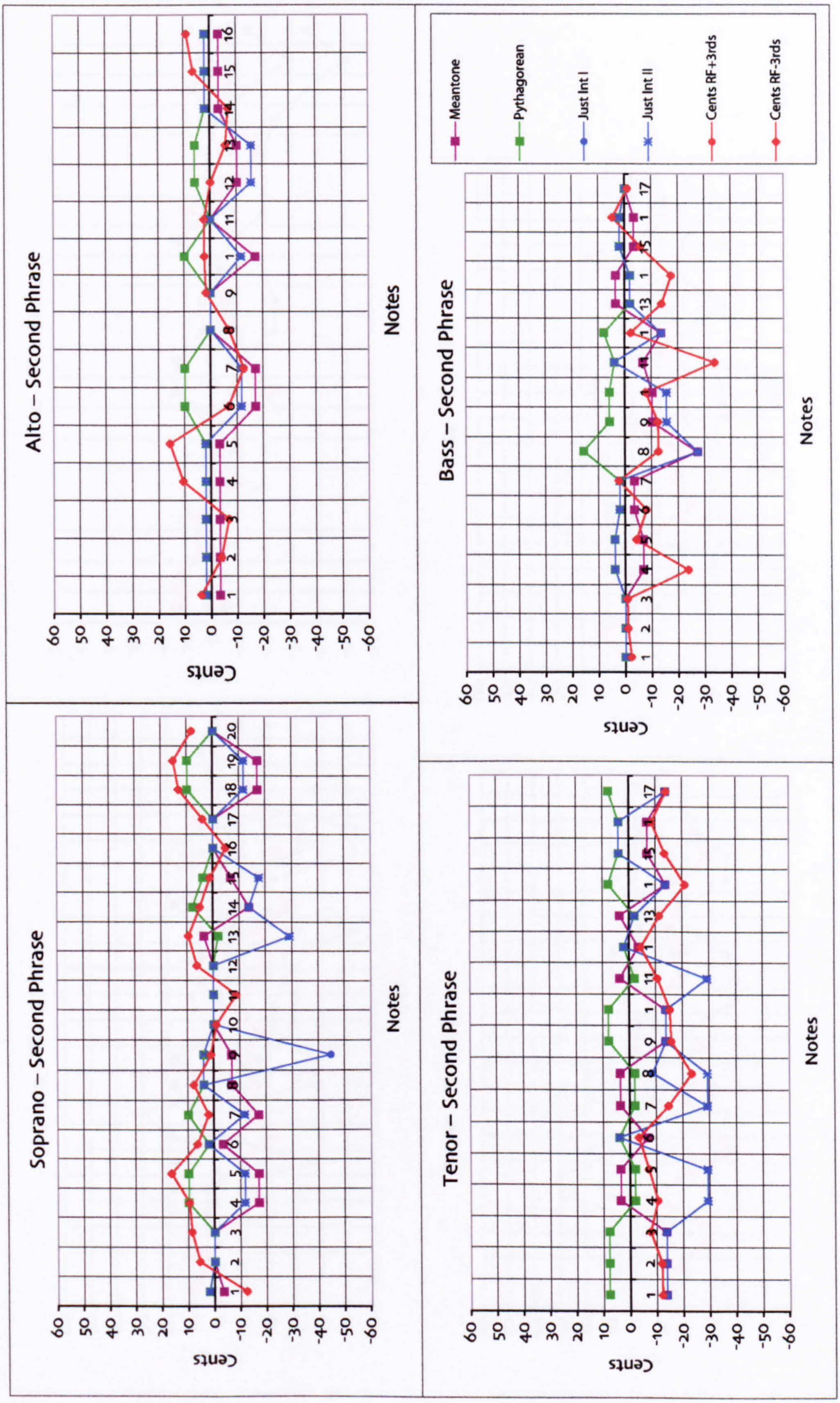
Just Int I	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Just Int II	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Pythagorean	-1.955	0.000	13.685	3.910	5.865	9.775	0.000	9.775	5.865	1.955	0.000	-1.955	7.820	3.910	3.910	0.000
Meantone	3.422	0.000	-23.951	-6.843	-10.264	-17.108	0.000	-17.108	-10.264	-3.421	0.000	3.422	-13.686	-6.843	-6.843	0.000
ALTO tk 01	365.567	385.617	369.134	326.369	292.313	272.054	289.800	291.099	290.775	276.868	276.300	293.750				
ALTO tk 02	364.039	385.908	368.718	328.850	295.295	276.267	297.674	294.947	293.522	278.221	279.451	294.831				
ALTO tk 03	368.607	387.127	369.844	326.785	291.719	274.422	293.609	293.248	293.226	276.784	278.883	294.548				
ALTO tk 04	365.415	383.075	366.577	327.047	294.283	274.015	291.582	291.187	290.103	274.449	275.359	291.671				
ALTO tk 05	361.750	378.993	364.603	324.047	289.725	276.966	292.127	291.656	290.346	273.490	274.897	289.286				
ALTO tk 06	365.494	387.458	368.380	326.064	289.334	274.262	290.900	288.950	291.903	275.513	275.258	293.020				
ALTO tk 07	363.604	378.055	367.941	324.391	289.620	275.570	292.737	291.331	290.824	273.929	276.200	293.255				
ALTO tk 08	366.937	383.112	367.175	325.844	288.934	273.557	291.920	289.206	290.414	273.770	272.887	290.185				
ALTO tk 09	361.712	379.866	363.727	324.507	291.025	273.008	288.851	290.168	287.809	271.902	272.204	288.478				
ALTO tk 10	361.889	382.109	362.327	321.551	287.170	272.276	289.937	290.242	287.668	272.226	273.142	289.106				
ALTO tk 11	364.643	383.783	363.851	323.716	288.250	274.918	291.315	292.406	289.658	272.911	275.011	289.352				
ALTO tk 12	365.747	384.482	368.615	325.347	291.121	272.649	295.574	292.870	292.241	277.359	277.046	292.351				
ALTO Average	364.617	383.298	366.741	325.376	290.733	274.164	292.169	291.443	290.707	274.785	275.553	291.653				
Cents RF+3rds	0.970	-12.526	11.025	3.843	8.943	7.357	17.474	13.166	8.793	11.277	16.109	14.413				
Cents RF-3rds	0.462	-13.034	10.517	3.335	8.435	6.849	16.966	12.659	8.285	10.769	15.601	13.906				
Just Int I	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000				
Just Int II	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000				
Pythagorean	7.820	-1.955	7.820	3.910	0.000	9.775	0.000	0.000	0.000	9.775	9.775	0.000				
Meantone	-13.686	3.422	-13.686	-6.843	0.000	-17.108	0.000	0.000	0.000	-17.108	-17.108	0.000				
TENOR tk 01	258.478	286.897	255.865	244.733	286.618	270.518	238.755	215.845	218.058	193.480	215.638	192.180	192.882	182.816		
TENOR tk 02	258.360	286.921	257.355	246.733	288.303	269.924	244.425	217.363	218.725	193.256	216.196	192.674	193.862	183.878		
TENOR tk 03	258.839	288.573	257.634	245.871	289.142	271.945	241.205	216.706	218.939	193.944	217.454	192.354	193.369	183.711		
TENOR tk 04	261.056	285.397	256.861	245.031	289.353	269.651	239.335	215.704	219.185	190.222	215.994	190.190	191.405	181.758		
TENOR tk 05	252.452	284.844	252.175	241.304	285.100	268.692	237.504	215.324	216.082	190.002	213.111	189.109	191.164	180.597		
TENOR tk 06	260.875	288.517	257.695	245.635	288.357	269.017	239.114	216.990	217.368	192.629	215.866	190.596	192.466	183.359		
TENOR tk 07	257.242	284.413	253.497	242.587	285.129	268.889	240.691	215.585	216.722	192.057	215.270	190.514	192.166	181.985		
TENOR tk 08	255.810	286.575	254.263	242.775	285.032	269.481	238.345	214.385	216.539	190.059	214.039	190.393	190.382	181.387		
TENOR tk 09	256.488	284.632	253.779	241.597	284.494	268.915	239.741	214.039	218.215	189.703	213.483	187.839	190.542	180.578		
TENOR tk 10	254.827	284.344	252.328	240.347	286.203	268.726	238.131	213.764	214.721	190.909	212.009	189.753	190.884	180.339		
TENOR tk 11	258.395	288.166	255.157	240.327	285.412	268.927	239.305	213.741	215.840	189.412	215.423	190.450	191.440	181.721		
TENOR tk 12	259.107	287.368	256.370	244.848	288.857	269.825	241.232	217.161	219.965	193.570	215.324	192.533	193.534	182.872		
TENOR Average	257.661	286.387	255.248	243.482	286.833	269.542	239.815	215.551	217.530	191.604	214.984	190.715	192.008	182.084		
Cents RF+3rds	-0.122	-17.128	-16.406	1.893	-14.433	-22.074	-24.379	-9.057	6.769	-12.939	-13.613	-20.983	-9.287	-1.168		
Cents RF-3rds	-0.630	-17.636	-16.914	1.385	-14.941	-22.582	-24.887	-9.565	6.261	-13.447	-14.121	-21.491	-9.795	-1.676		
Just Int I	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686		
Just Int II	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686		
Pythagorean	-3.910	0.000	-3.910	5.865	0.000	9.775	5.865	1.955	1.955	-1.955	1.955	-1.955	-1.955	7.820		
Meantone	6.843	0.000	6.843	-10.264	0.000	-17.108	-10.264	-3.421	-3.421	3.422	-3.421	3.422	3.422	-13.686		

BASS tk 01	217.352	228.493	218.727	206.461	193.237	184.632	121.488	109.333	108.992	145.853
BASS tk 02	218.180	230.602	219.368	206.058	194.151	187.621	122.554	108.874	108.274	146.395
BASS tk 03	214.725	228.396	215.245	205.936	193.499	187.129	121.893	109.134	108.666	146.500
BASS tk 04	214.692	227.246	216.872	206.102	195.035	186.129	121.877	108.491	108.163	144.746
BASS tk 05	213.801	225.144	214.316	203.896	190.978	183.124	120.368	107.763	107.933	144.034
BASS tk 06	217.646	231.465	217.356	205.132	193.104	185.240	120.972	108.429	108.207	145.535
BASS tk 07	213.898	225.611	214.918	203.136	190.501	182.506	120.463	107.953	107.372	145.334
BASS tk 08	215.370	227.861	215.905	203.941	192.111	181.019	119.601	107.962	106.894	144.381
BASS tk 09	214.252	228.019	217.061	204.382	191.848	183.485	119.946	107.031	107.559	144.310
BASS tk 10	214.756	228.723	215.900	204.522	193.739	181.463	118.781	106.617	104.896	143.254
BASS tk 11	215.646	227.041	215.514	203.644	193.244	182.398	120.805	108.621	107.873	144.589
BASS tk 12	219.473	229.652	218.100	204.391	193.018	183.805	121.122	108.789	108.986	145.995
BASS Average	215.816	228.188	216.607	204.800	192.872	184.046	120.822	108.250	107.818	145.077
Cents RF+3rds	-6.927	-10.423	-0.594	2.373	-1.515	17.391	-11.224	-1.453	-8.374	5.497
Cents RF-3rds	-7.434	-10.930	-1.101	1.865	-2.023	16.883	-11.731	-1.961	-8.881	4.989
Just Int I	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Just Int II	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Pythagorean	1.955	-7.820	1.955	11.730	-1.955	7.820	5.865	1.955	1.955	0.000
Meantone	-3.421	13.686	-3.421	-20.530	3.422	-13.686	-10.264	-3.421	-3.421	0.000



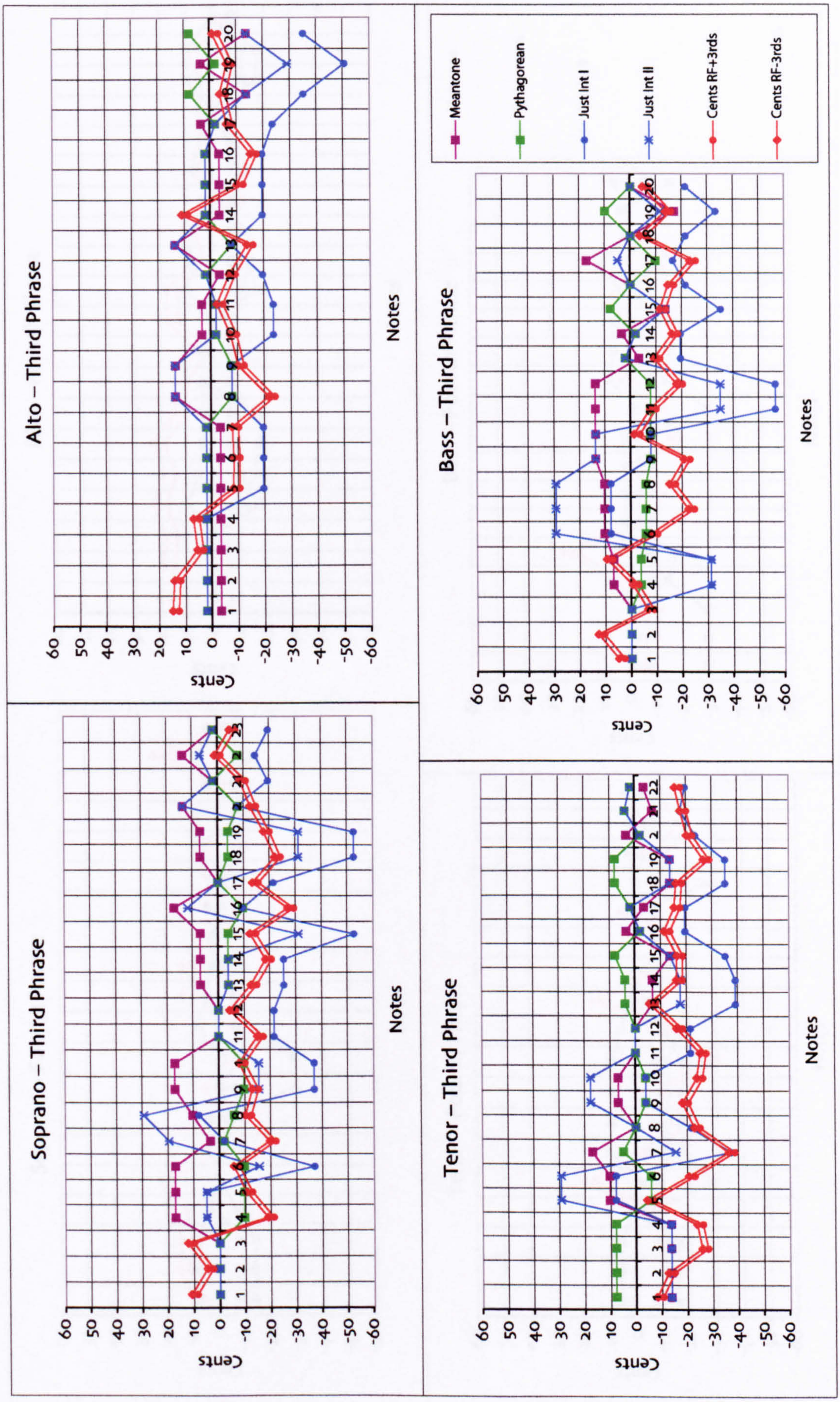
10.1A - RAM VOICE'S CHARTS – PHRASE 1

10.1A - RAM VOICE'S CHARTS – PHRASE 1



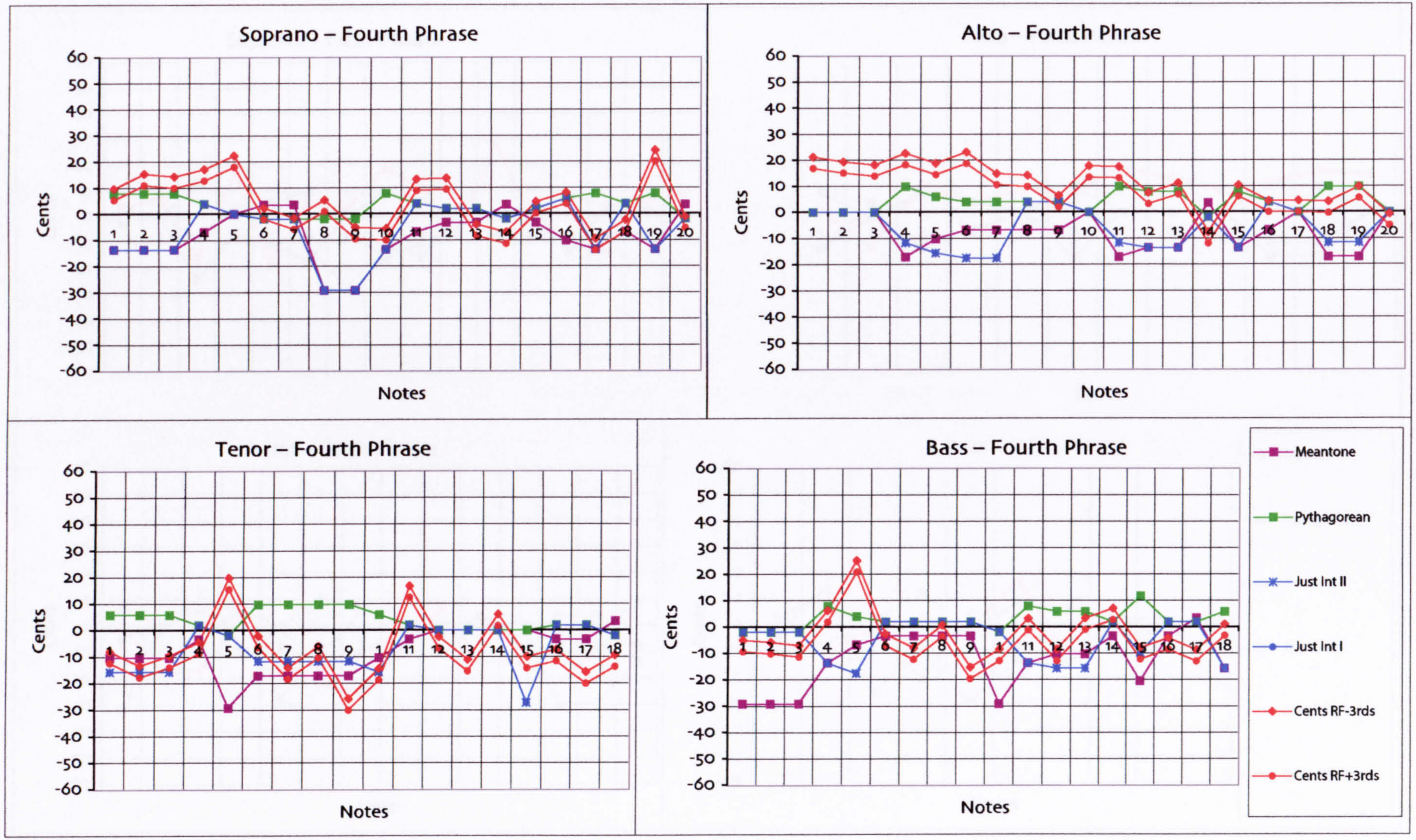
10.1B - RAM VOICE'S CHARTS – PHRASE 2

10.1B - RAM VOICE'S CHARTS – PHRASE 2

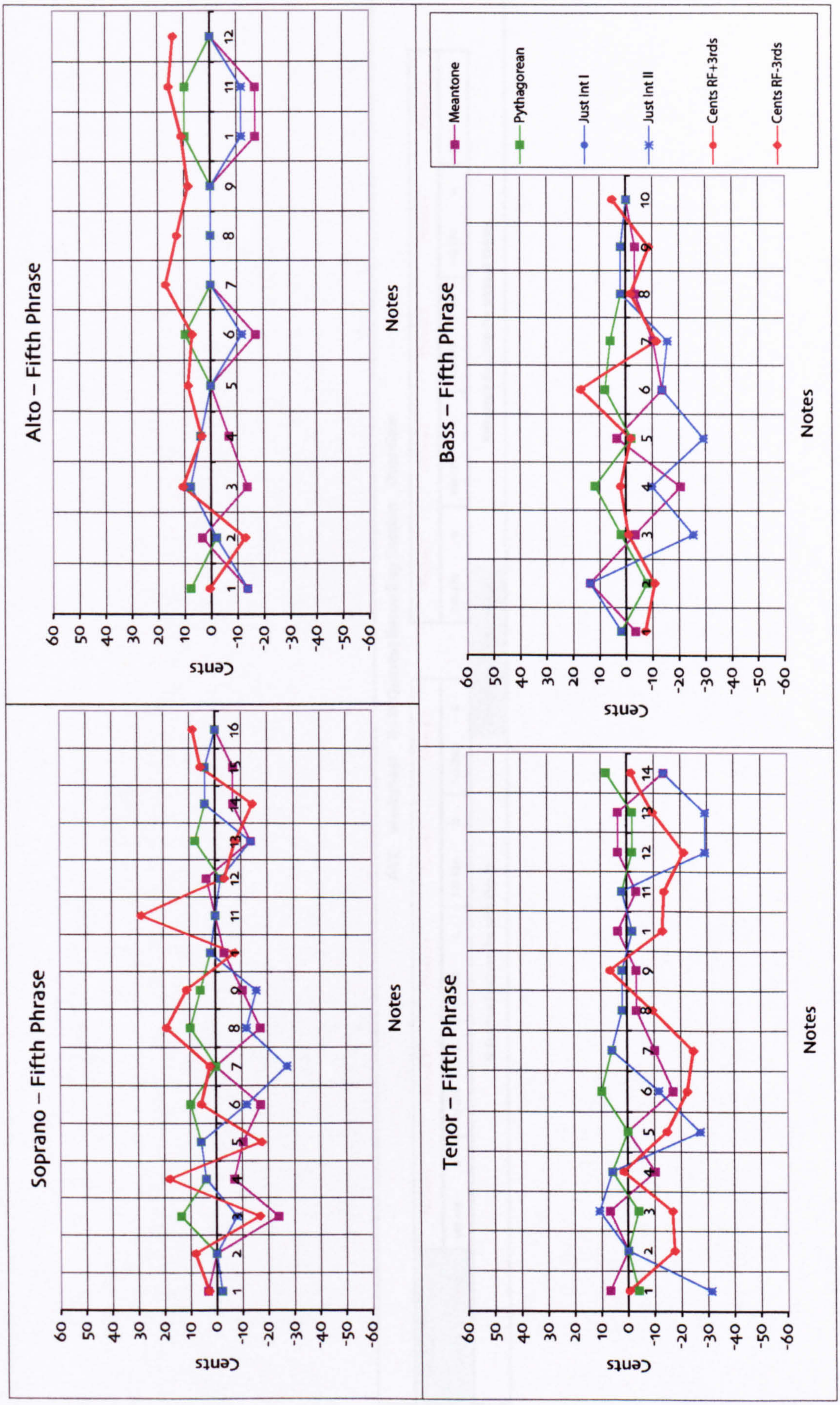


10.1c - RAM VOICE'S CHARTS – PHRASE 3

10.1C - RAM VOICE'S CHARTS – PHRASE 3


Soprano – Fourth Phrase
Alto – Fourth Phrase
Tenor – Fourth Phrase
Bass – Fourth Phrase
Cents
Notes
Meantone
Pythagorean
Just Int II
Just Int I
Cents RF-3rds
Cents RF+3rds

10.1D - RAM VOICE'S CHARTS – PHRASE 4



10.1E - RAM VOICE'S CHARTS – PHRASE 5

10.1E - RAM VOICE'S CHARTS – PHRASE 5

AVC _ Worksheet _ RAM Quartet Recording Session _ Overview

145.758 Gen RF +	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5
145.570 Gen RF -	145.758 D	109.319 A	109.319 A	145.758 D	145.758 D

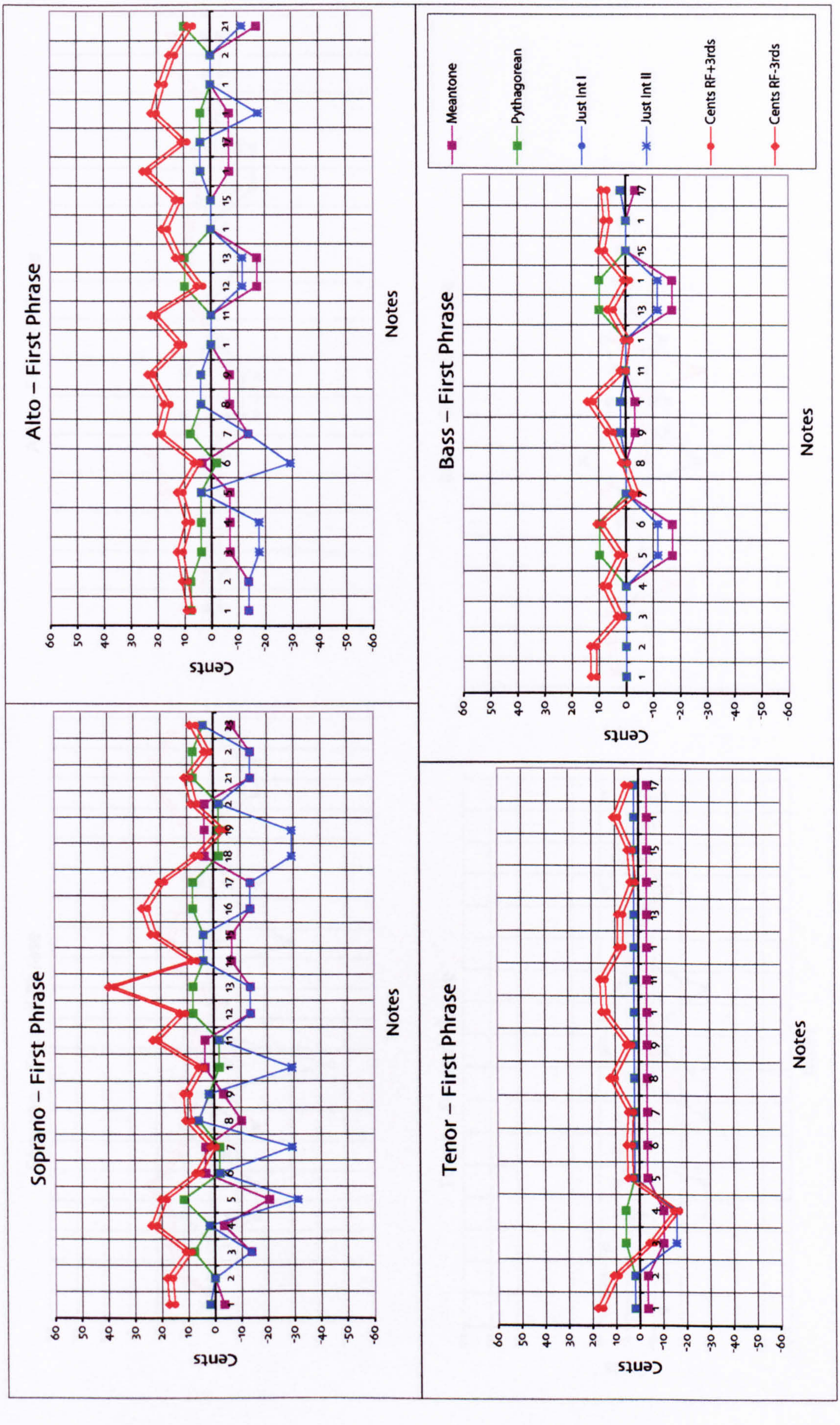
Reference Frequencies with Thirds

Frequency Measurements

Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5
145.570 D	109.177 A	109.177 A	145.570 D	145.570 D

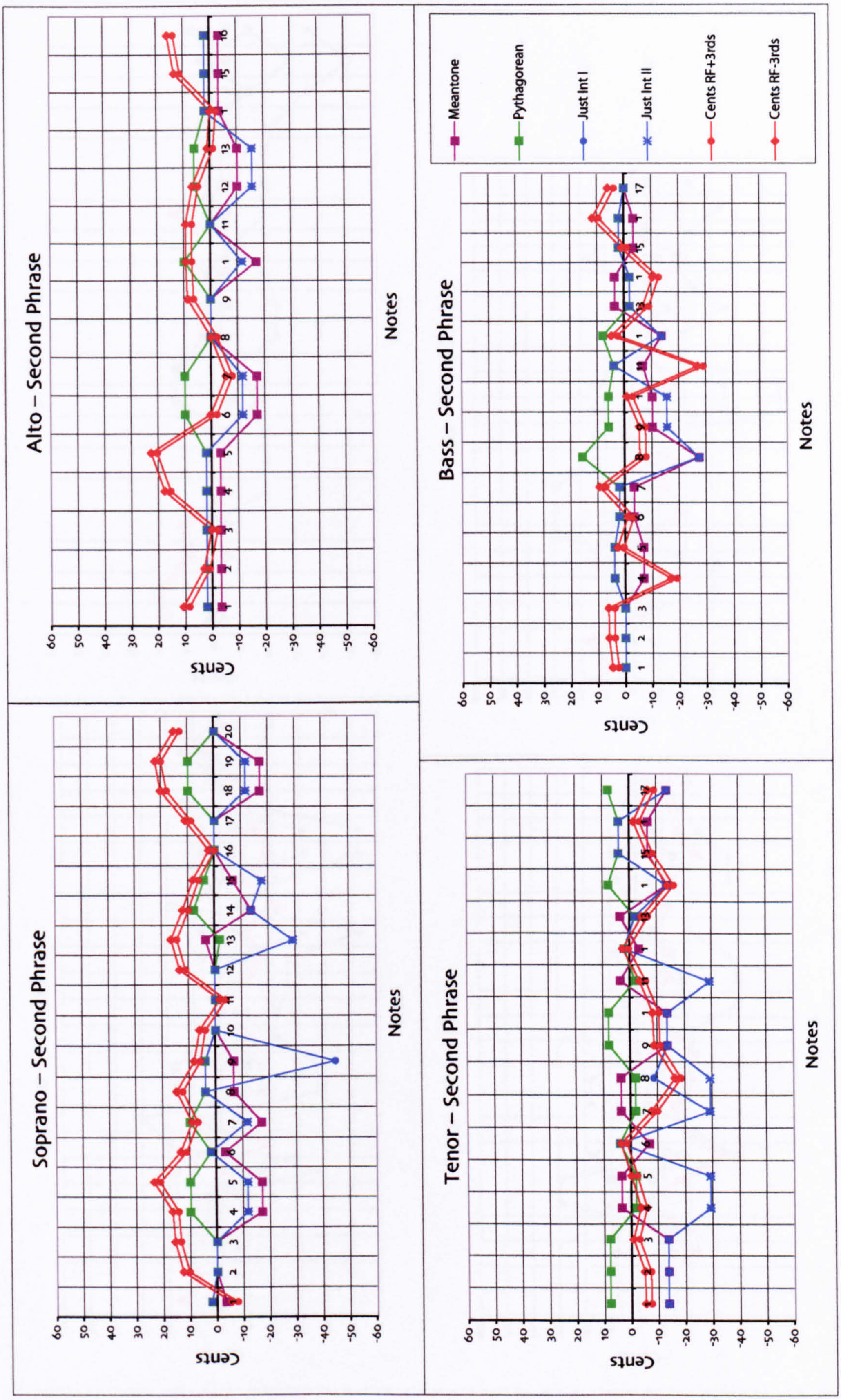
Reference Frequencies without Thirds

10.2 - RAM VOICE'S TABLE – EQUALISED REFERENCE FREQUENCIES



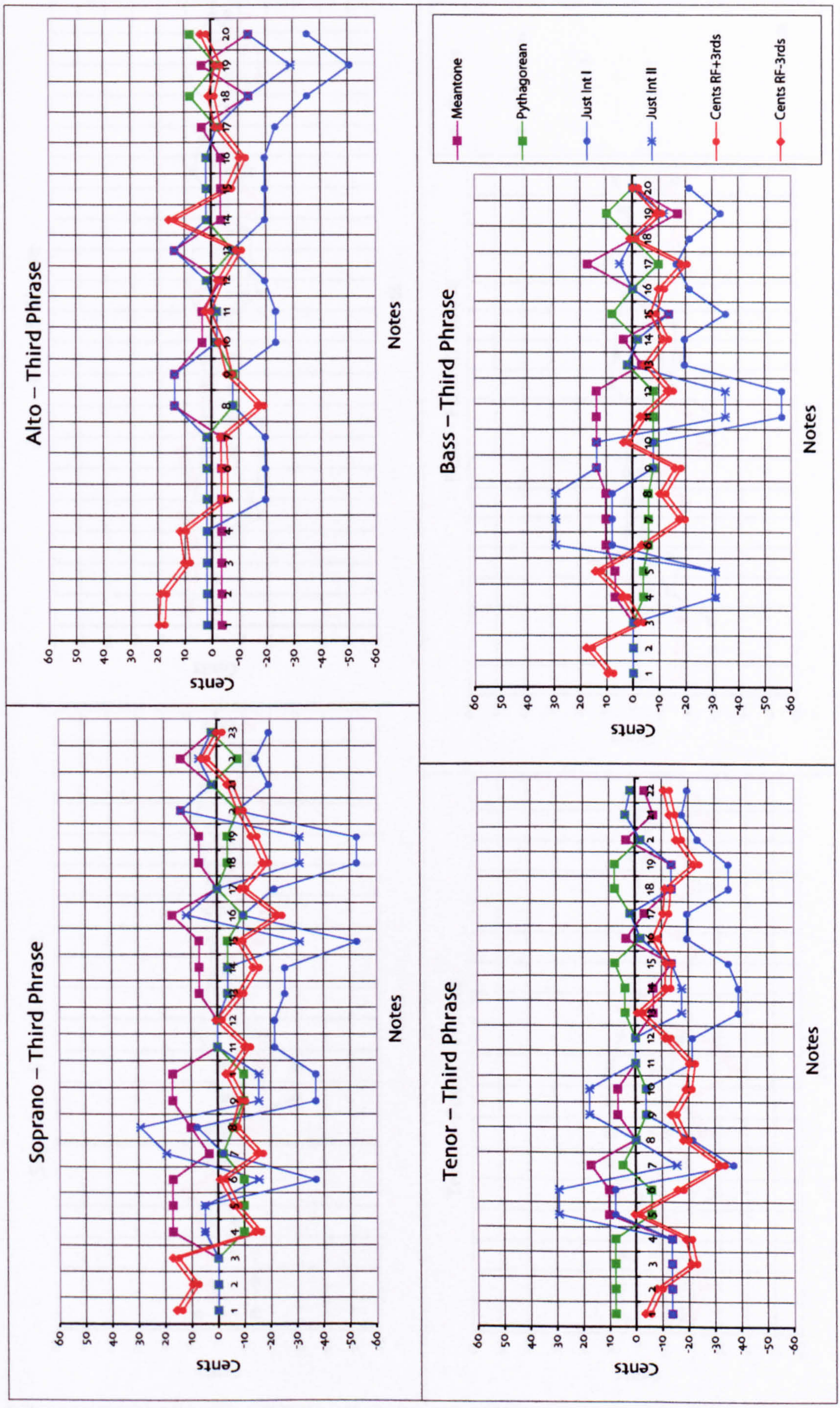
10.2A - RAM VOICES' CHARTS (EQUALISED) – PHRASE 1

10.2A - RAM VOICES' CHARTS (EQUALISED) – PHRASE 1



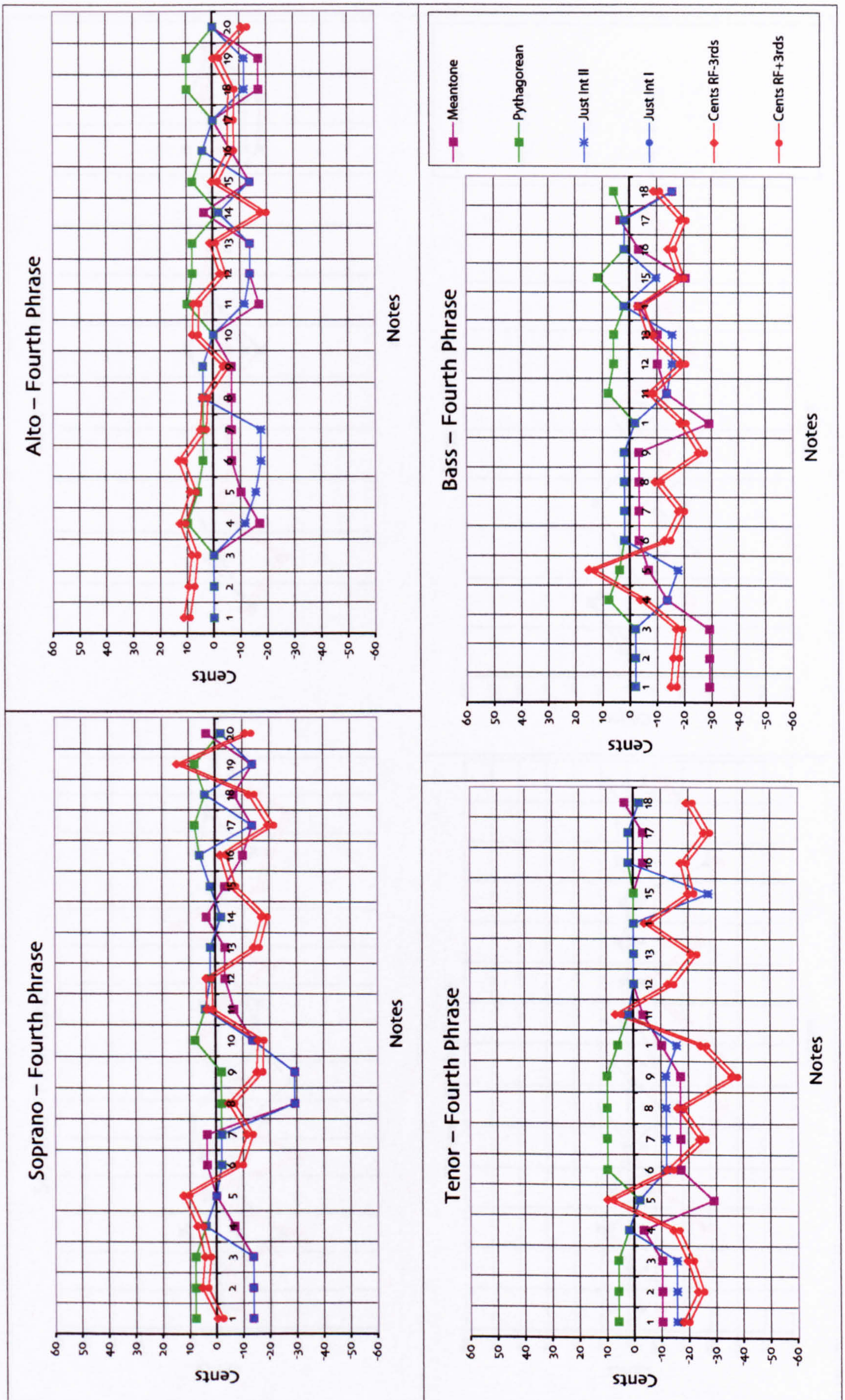
10.2B - RAM VOICES' CHARTS (EQUALISED) – PHRASE 2

10.2B - RAM VOICES' CHARTS (EQUALISED) – PHRASE 2



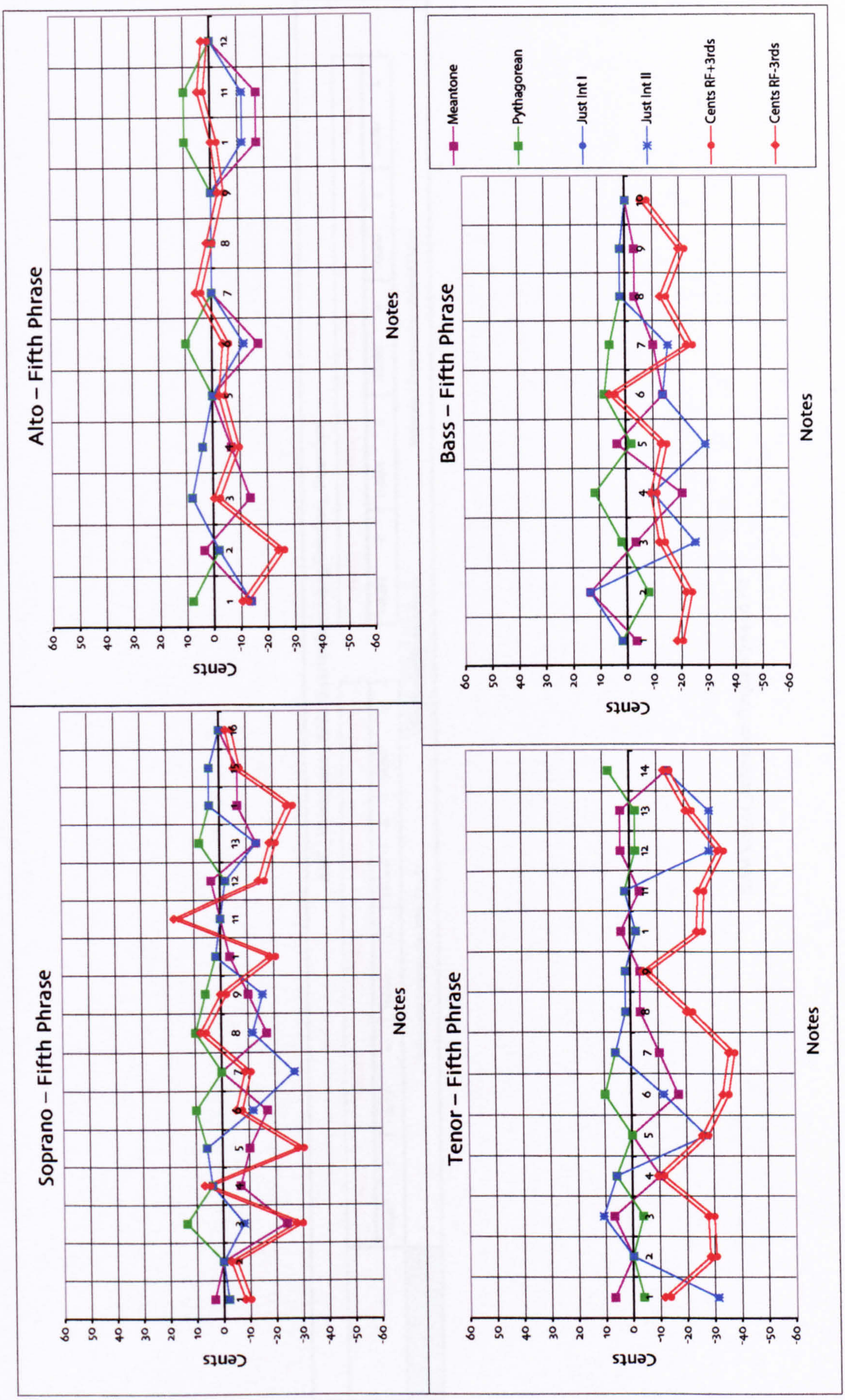
10.2c - RAM voices' Charts (equalised) – Phrase 3

10.2C - RAM VOICES' CHARTS (EQUALISED) – PHRASE 3



10.2D - RAM VOICES' CHARTS (EQUALISED) – PHRASE 4

10.2D - RAM VOICES' CHARTS (EQUALISED) – PHRASE 4



10.2E - RAM VOICES' CHARTS (EQUALISED) – PHRASE 5

10.2E - RAM VOICES' CHARTS (EQUALISED) – PHRASE 5

AVC _ Worksheet _ RAM Quartet Recording Session _ Overview

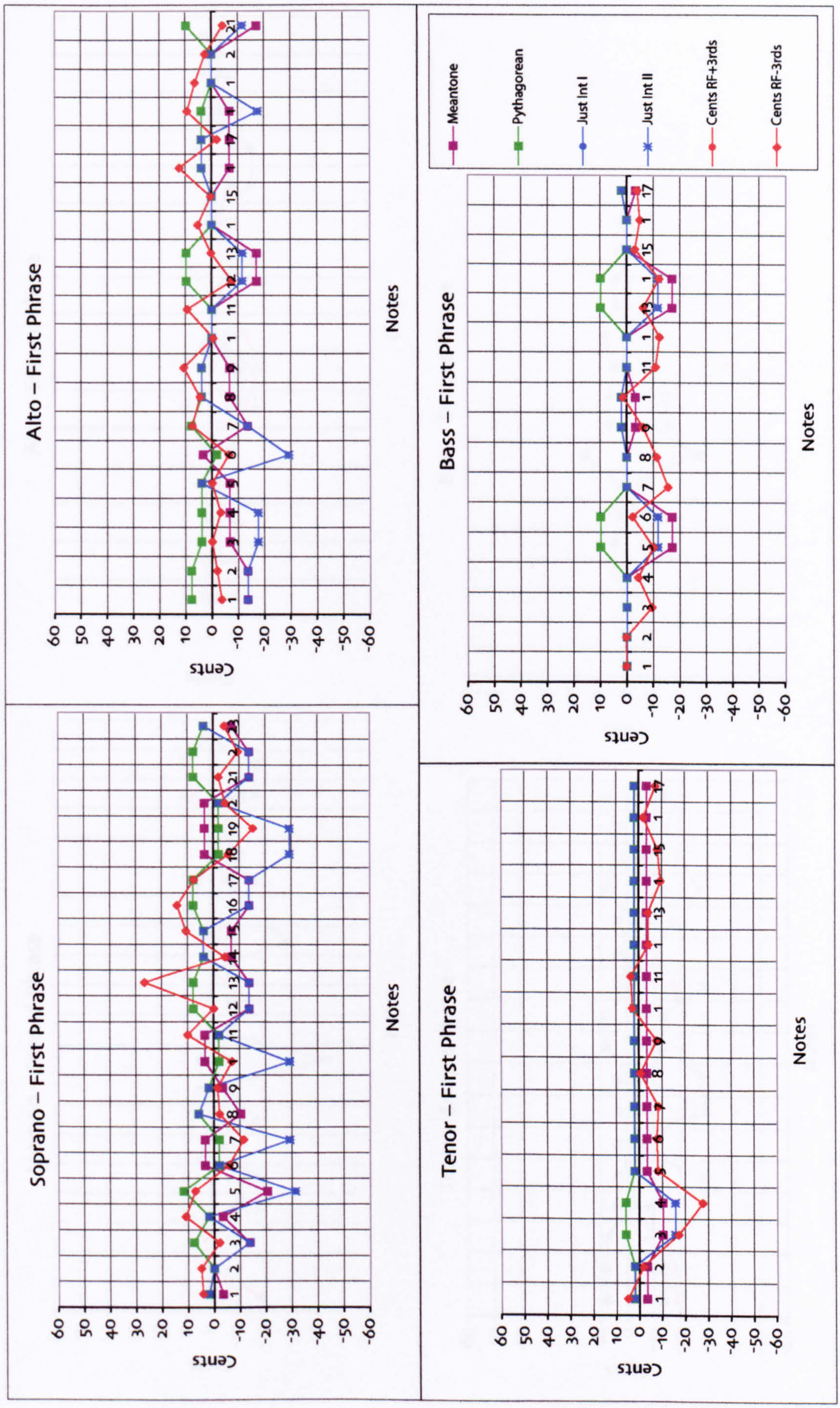
	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5
	146.667 D	110.000 A	110.000 A	146.667 D	146.667 D
146.667 Gen RF A=440Hz	Reference Frequencies with Thirds				

Frequency Measurements

Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5
146.667 D	110.000 A	110.000 A	146.667 D	146.667 D

Reference Frequencies without Thirds

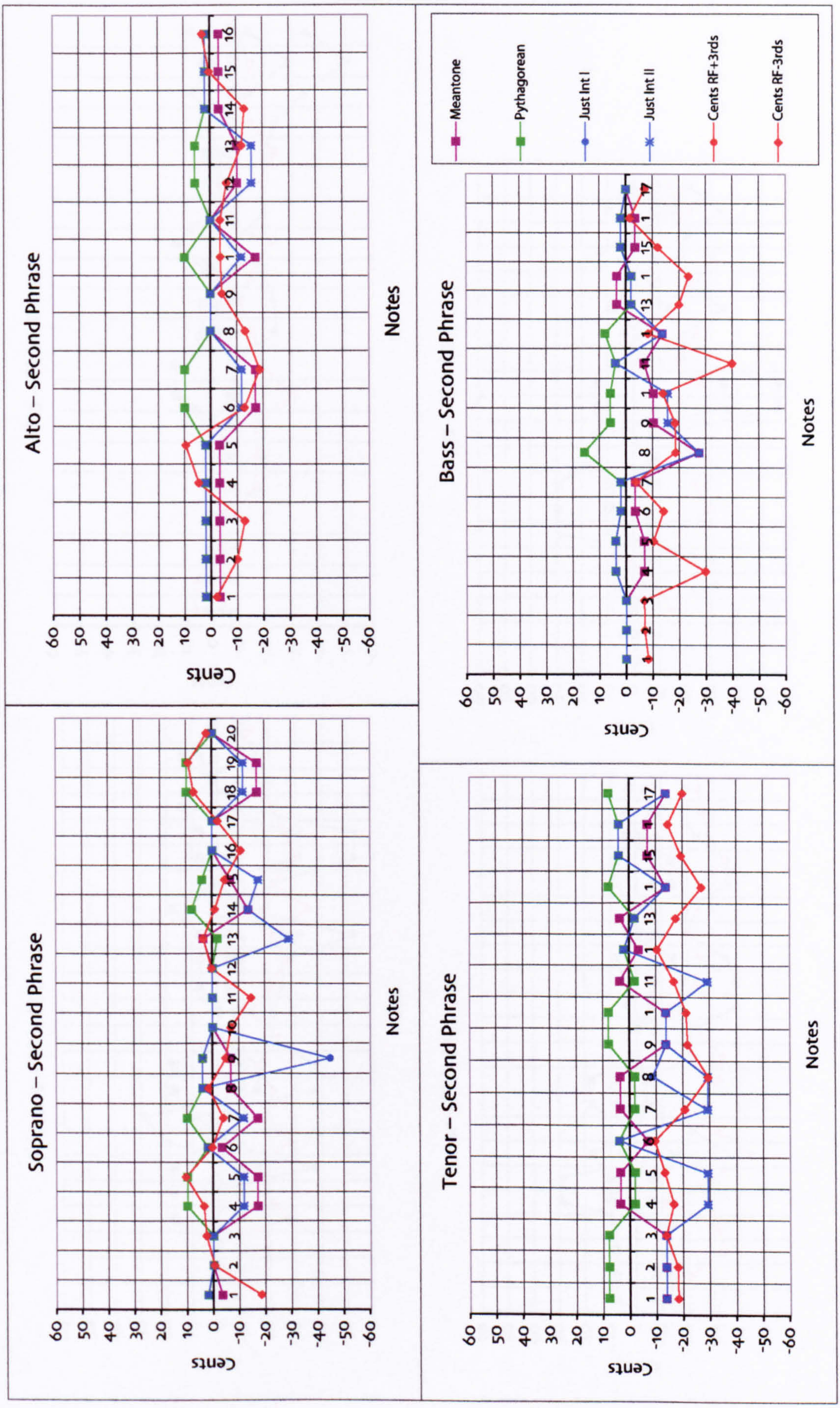
10.3 - RAM VOICE'S RESULTS (REFERENCE FREQUENCY = 440 HZ)



10.3A - RAM VOICES' CHARTS (440 HZ) – PHRASE 1

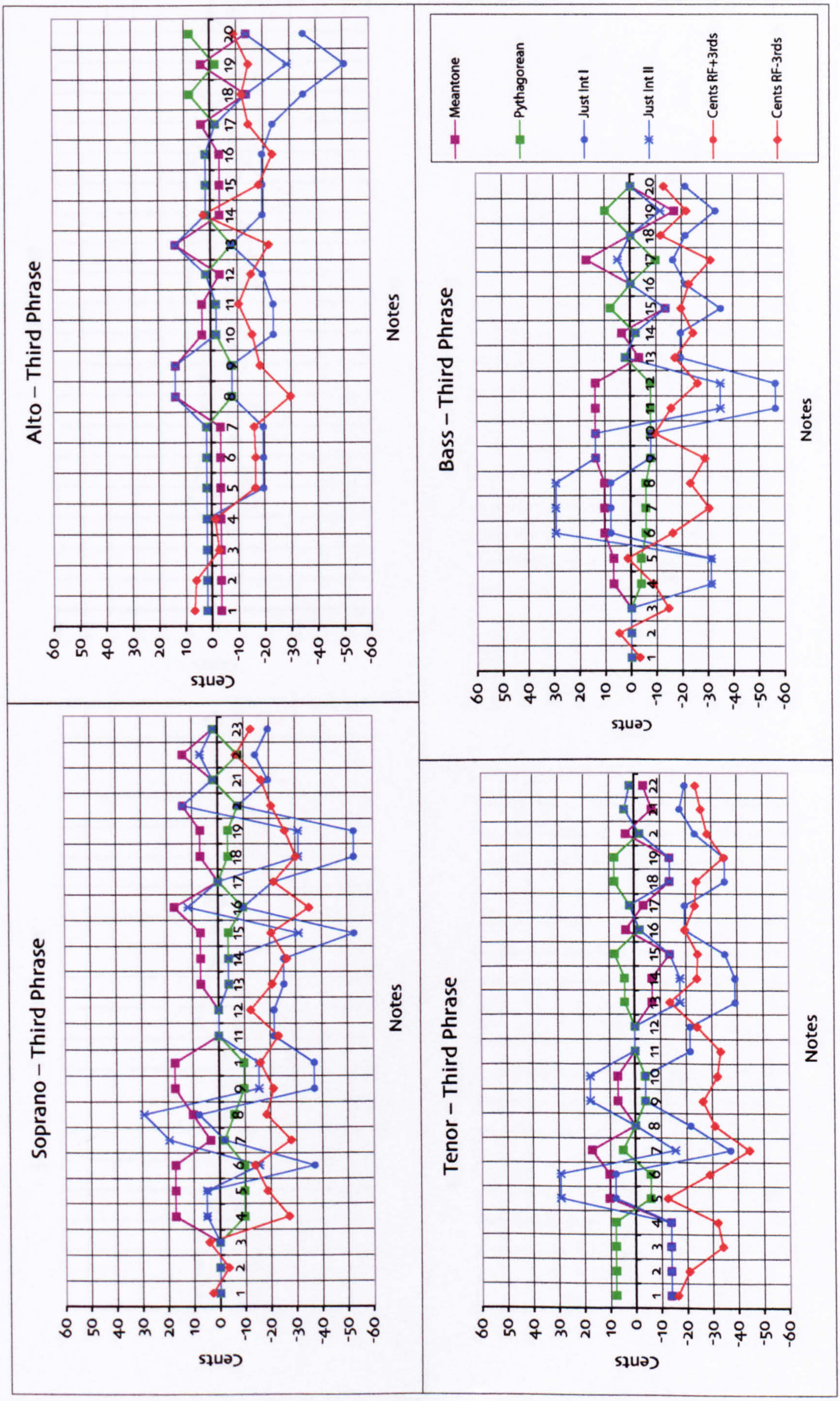


10.3A - RAM VOICES' CHARTS (440 HZ) – PHRASE 1



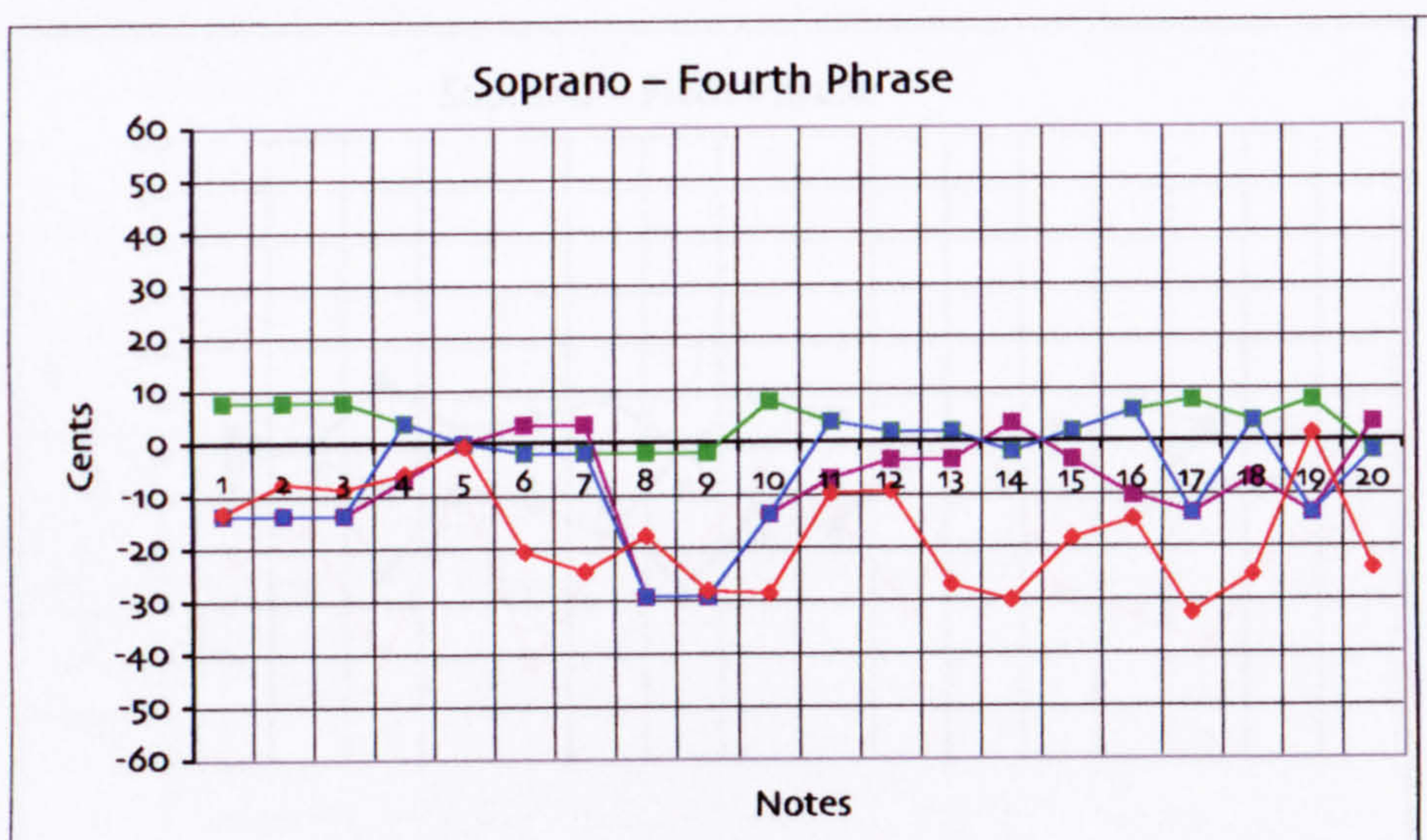
10.3B - RAM VOICES' CHARTS (440 HZ) – PHRASE 2

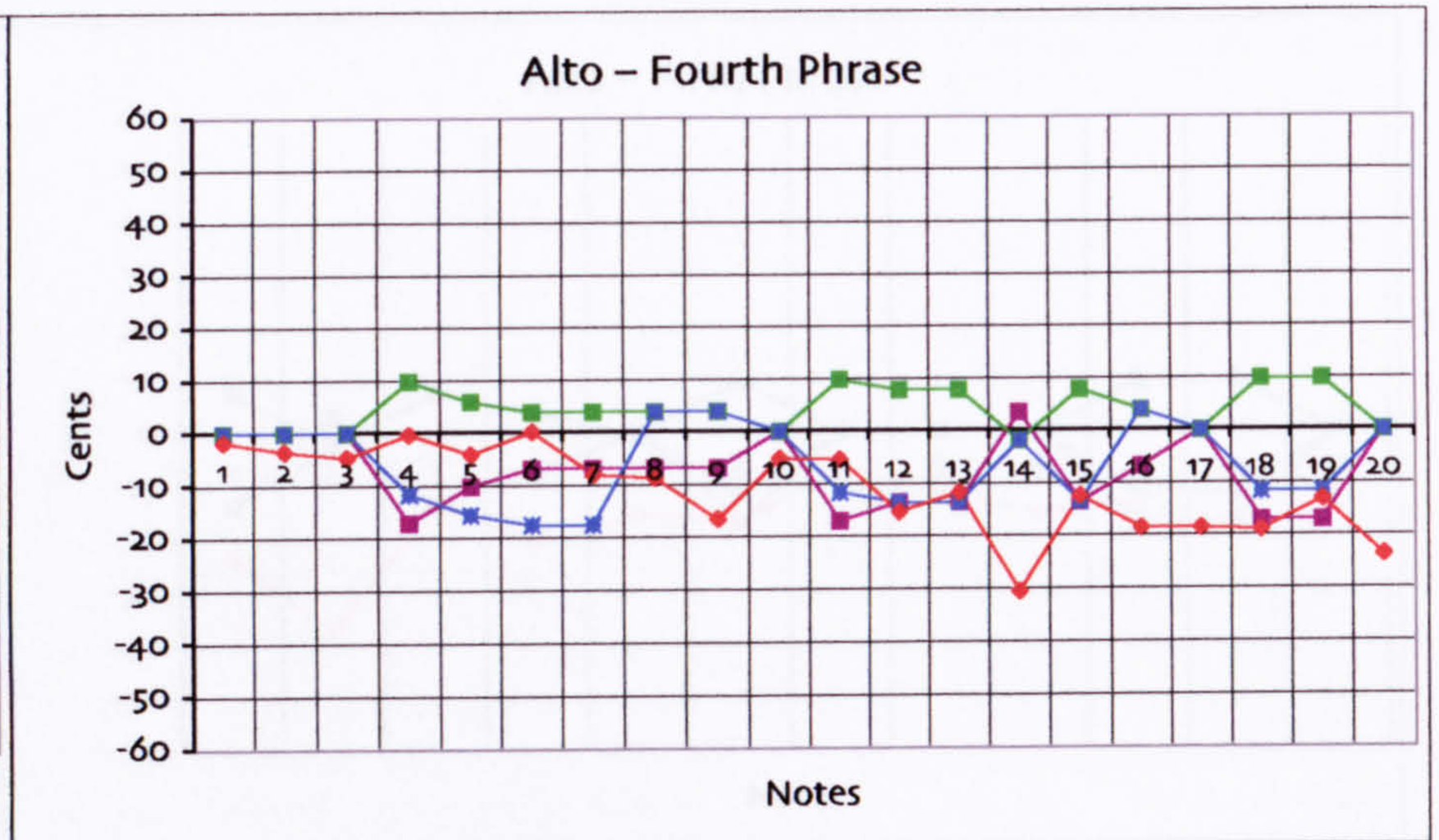
10.3B - RAM VOICES' CHARTS (440 HZ) – PHRASE 2

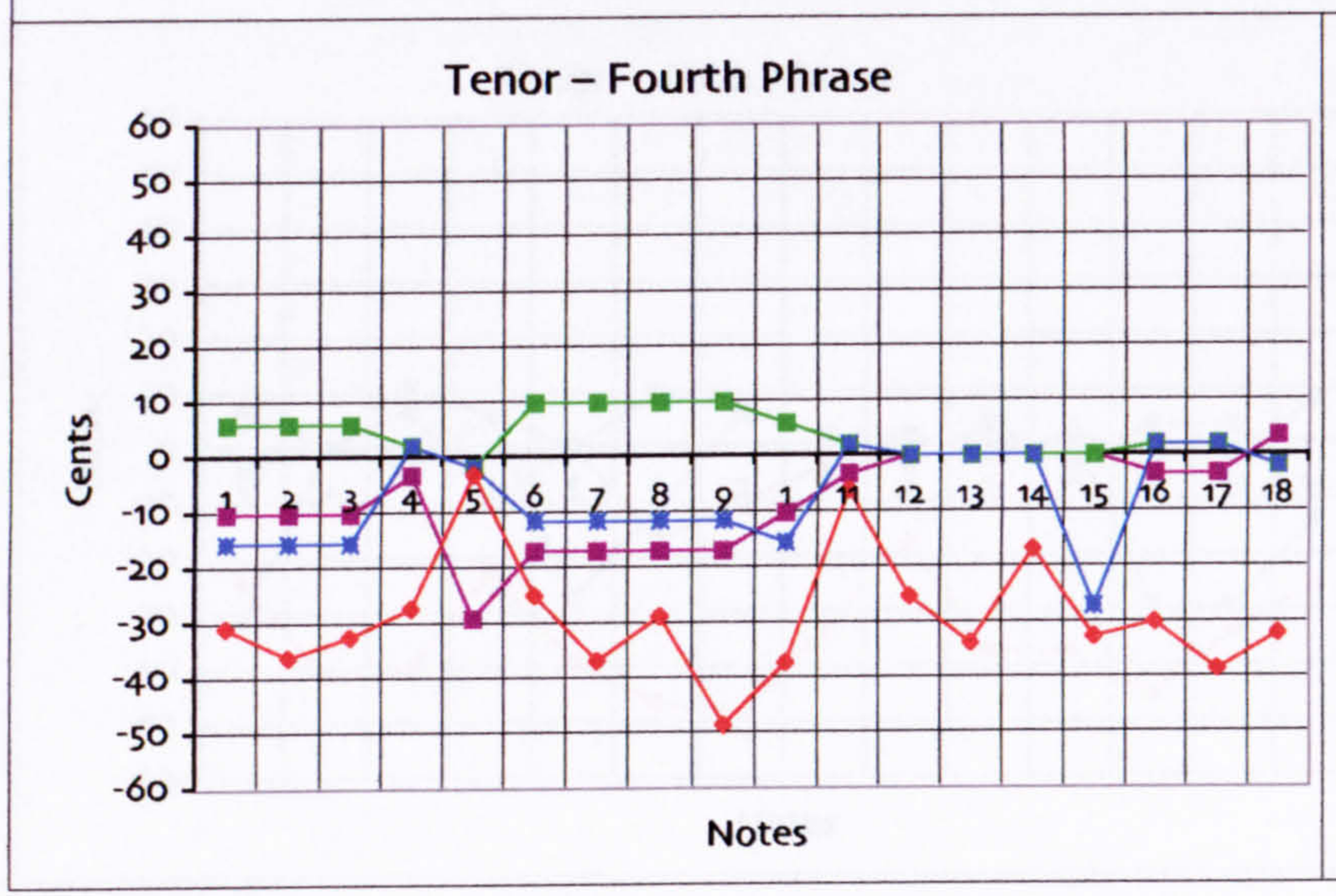


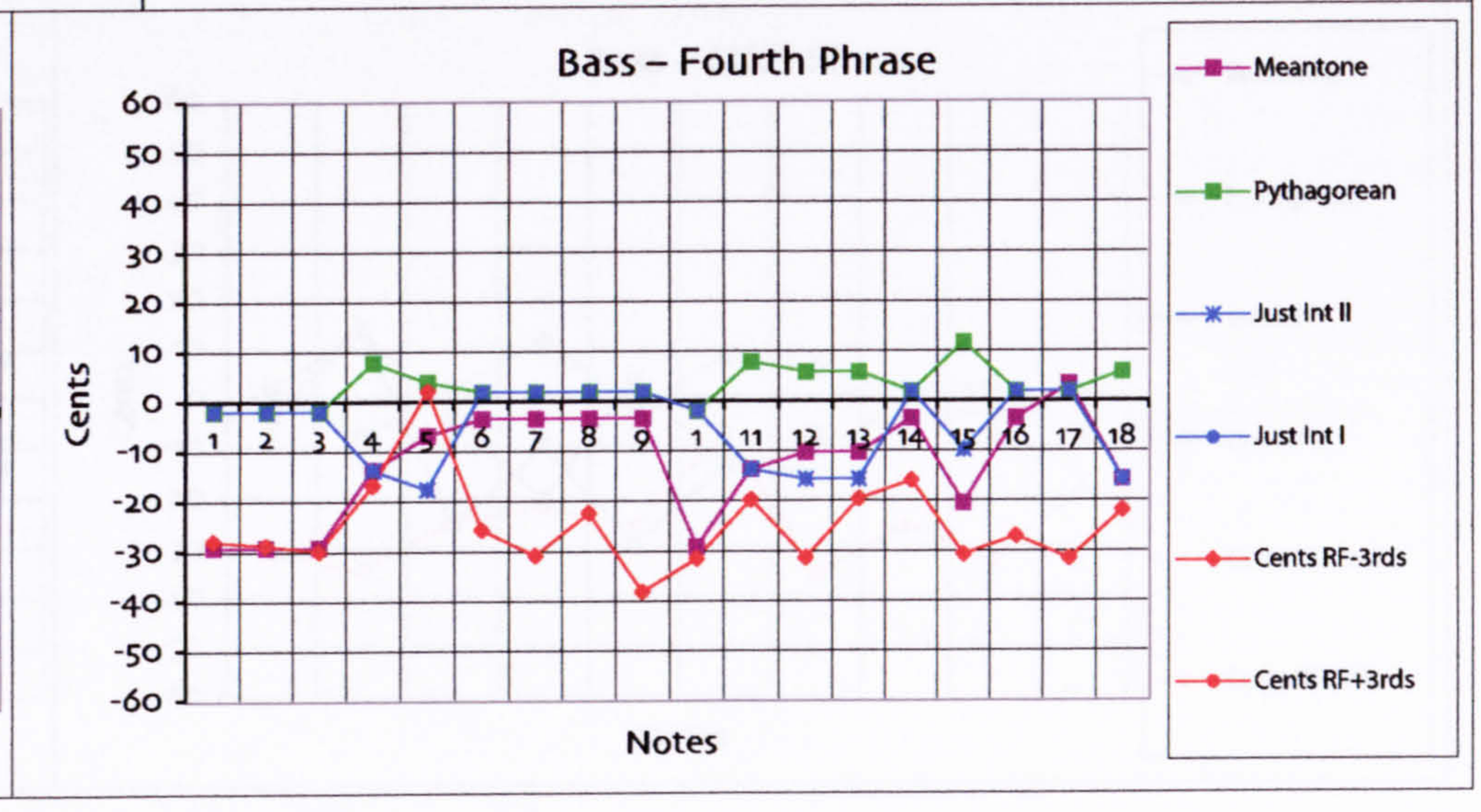
10.3c - RAM voices' Charts (440 Hz) – Phrase 3

10.3c - RAM voices' Charts (440 Hz) – Phrase 3

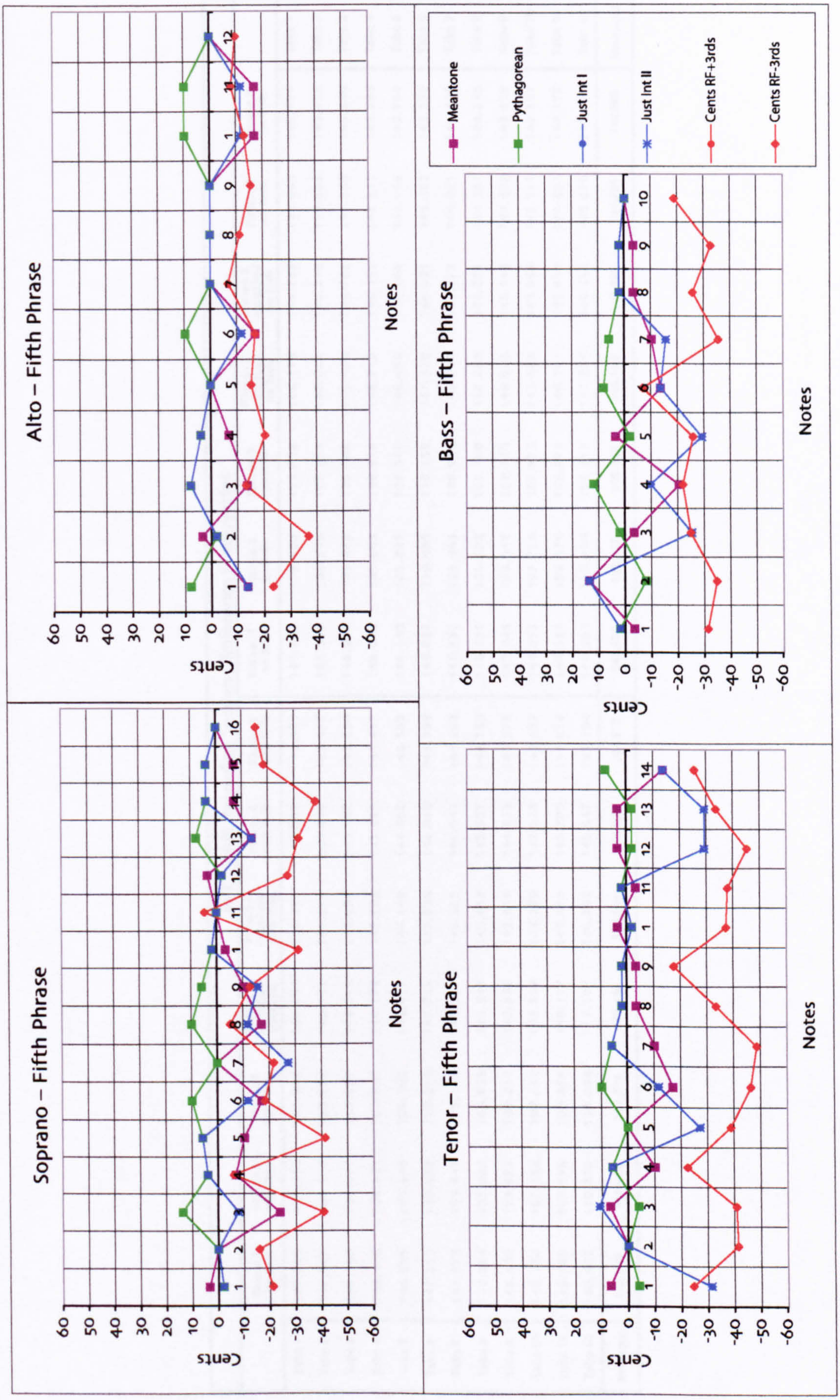

Soprano – Fourth Phrase
Cents
Notes


Alto – Fourth Phrase
Cents
Notes


Tenor – Fourth Phrase
Cents
Notes


Bass – Fourth Phrase
Cents
Notes
Meantone
Pythagorean
Just Int II
Just Int I
Cents RF-3rds
Cents RF+3rds

10.3D - RAM VOICES' CHARTS (440 HZ) – PHRASE 4

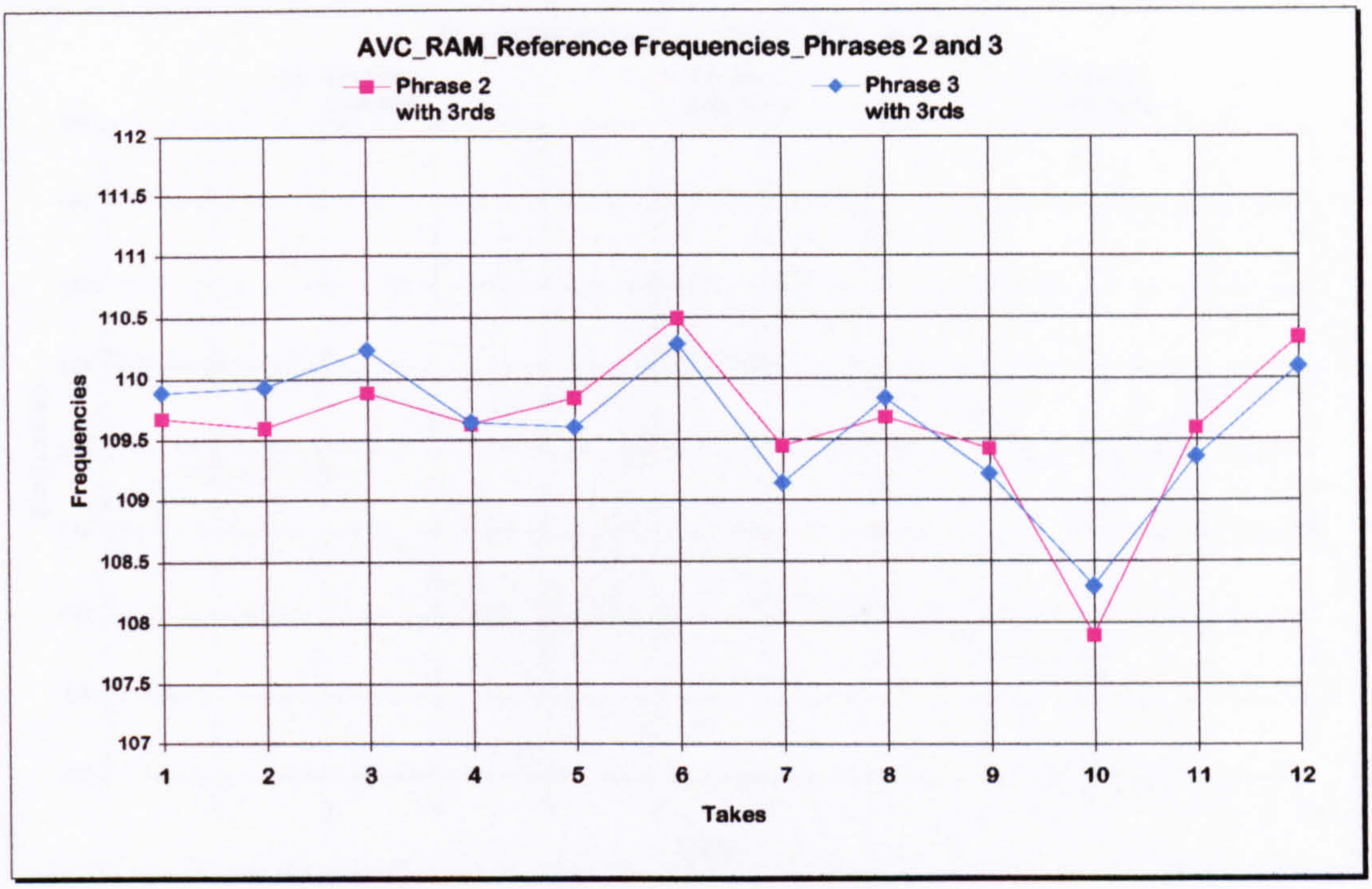


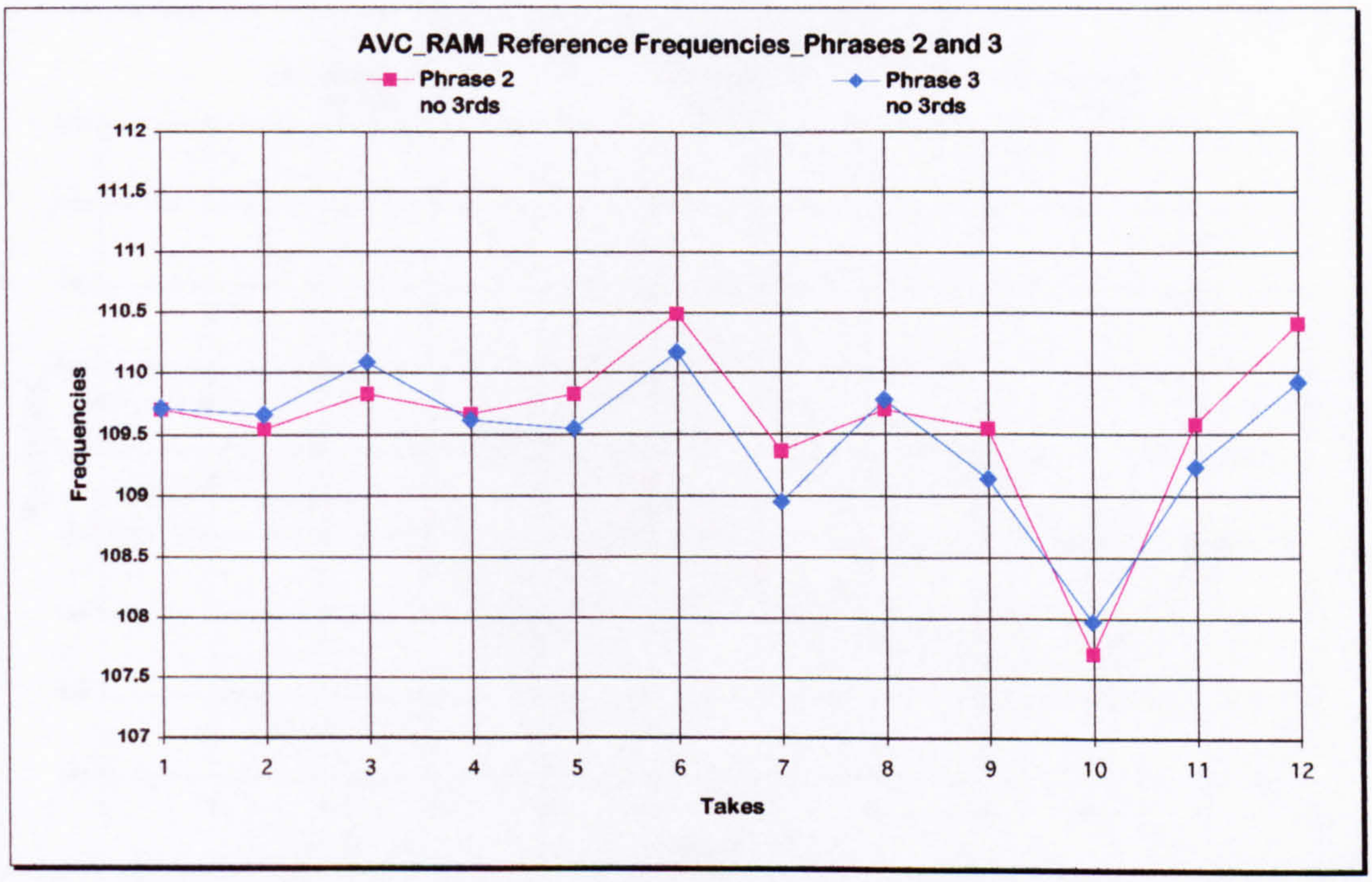
10.3E - RAM voices' Charts (440 Hz) – Phrase 5

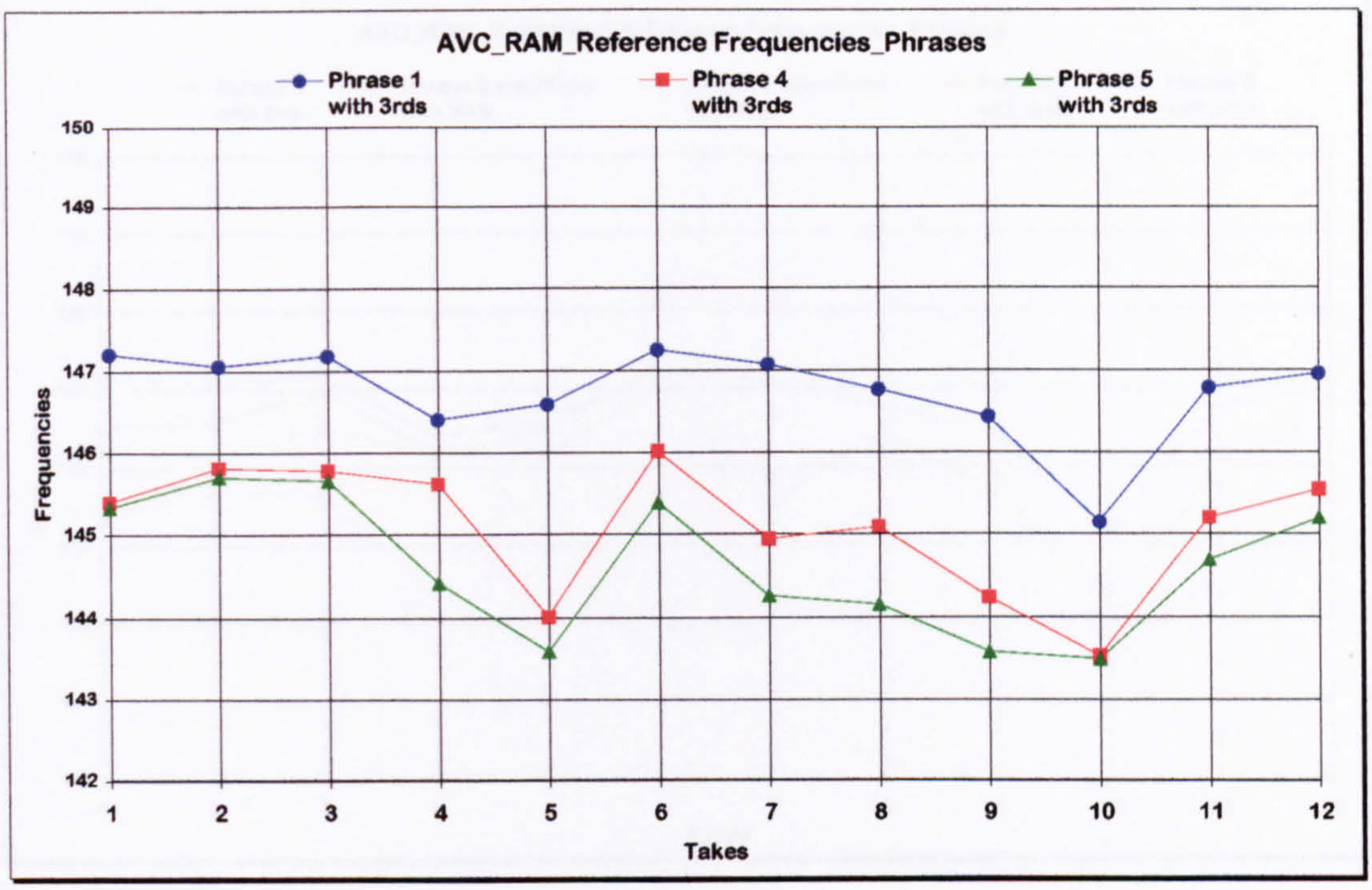
10.3E - RAM VOICES' CHARTS (440 HZ) – PHRASE 5

AVC _ RAM Recording Session _ Reference Frequencies															
	Phrase 1 with 3rds	Phrase 2 with 3rds	Phrase 3 with 3rds	Phrase 2 equalised with 3rds	Phrase 3 equalised with 3rds	Phrase 4 with 3rds	Phrase 5 with 3rds	Phrase 1 no 3rds	Phrase 2 no 3rds	Phrase 3 no 3rds	Phrase 2 equalised no 3rds	Phrase 3 equalised no 3rds	Phrase 4 no 3rds	Phrase 5 no 3rds	
Take 1	147.205	109.675	109.890	146.234	146.520	145.392	145.324	146.606	109.705	109.712	146.273	146.283	145.064	145.494	**Take 1**
Take 2	147.062	109.599	109.934	146.131	146.579	145.819	145.697	146.548	109.546	109.664	146.061	146.218	145.589	145.696	**Take 2**
Take 3	147.186	109.887	110.237	146.516	146.982	145.782	145.654	146.816	109.829	110.089	146.439	146.785	145.358	145.640	**Take 3**
Take 4	146.406	109.631	109.645	146.175	146.193	145.619	144.417	146.013	109.664	109.616	146.219	146.155	145.211	144.568	**Take 4**
Take 5	146.595	109.843	109.605	146.457	146.140	144.008	143.583	146.160	109.827	109.546	146.436	146.062	143.466	143.764	**Take 5**
Take 6	147.253	110.489	110.279	147.319	147.038	146.018	145.386	146.882	110.490	110.169	147.320	146.893	145.633	145.333	**Take 6**
Take 7	147.073	109.445	109.144	145.927	145.525	144.943	144.253	146.737	109.363	108.955	145.817	145.273	144.621	144.326	**Take 7**
Take 8	146.774	109.682	109.839	146.243	146.452	145.093	144.153	146.331	109.698	109.780	146.263	146.374	144.947	144.245	**Take 8**
Take 9	146.440	109.421	109.214	145.895	145.619	144.235	143.579	145.845	109.542	109.138	146.056	145.518	143.872	143.538	**Take 9**
Take 10	145.150	107.894	108.292	143.859	144.389	143.528	143.487	144.851	107.705	107.973	143.606	143.964	143.111	143.391	**Take 10**
Take 11	146.788	109.595	109.359	146.127	145.812	145.205	144.679	146.561	109.576	109.229	146.101	145.639	144.892	144.779	**Take 11**
Take 12	146.952	110.330	110.094	147.107	146.792	145.547	145.194	146.563	110.404	109.917	147.206	146.556	145.070	145.144	**Take 12**
Averages	**146.740**	**109.624**	**109.628**	**146.166**	**146.170**	**145.099**	**144.617**	**146.326**	**109.612**	**109.482**	**146.150**	**145.977**	**144.736**	**144.660**	**Averages**

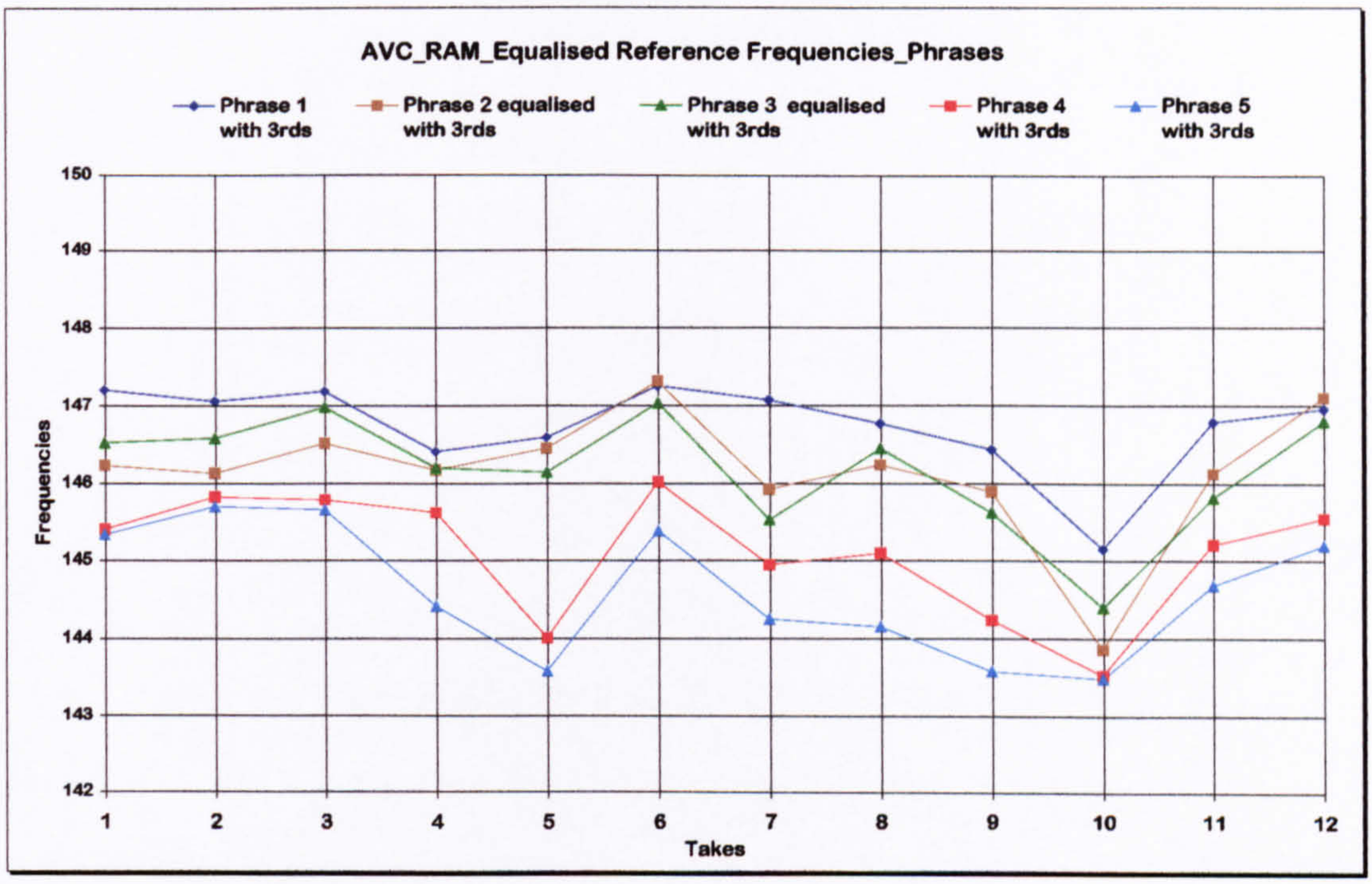
10.4 – RAM REFERENCE FREQUENCIES' RESULTS

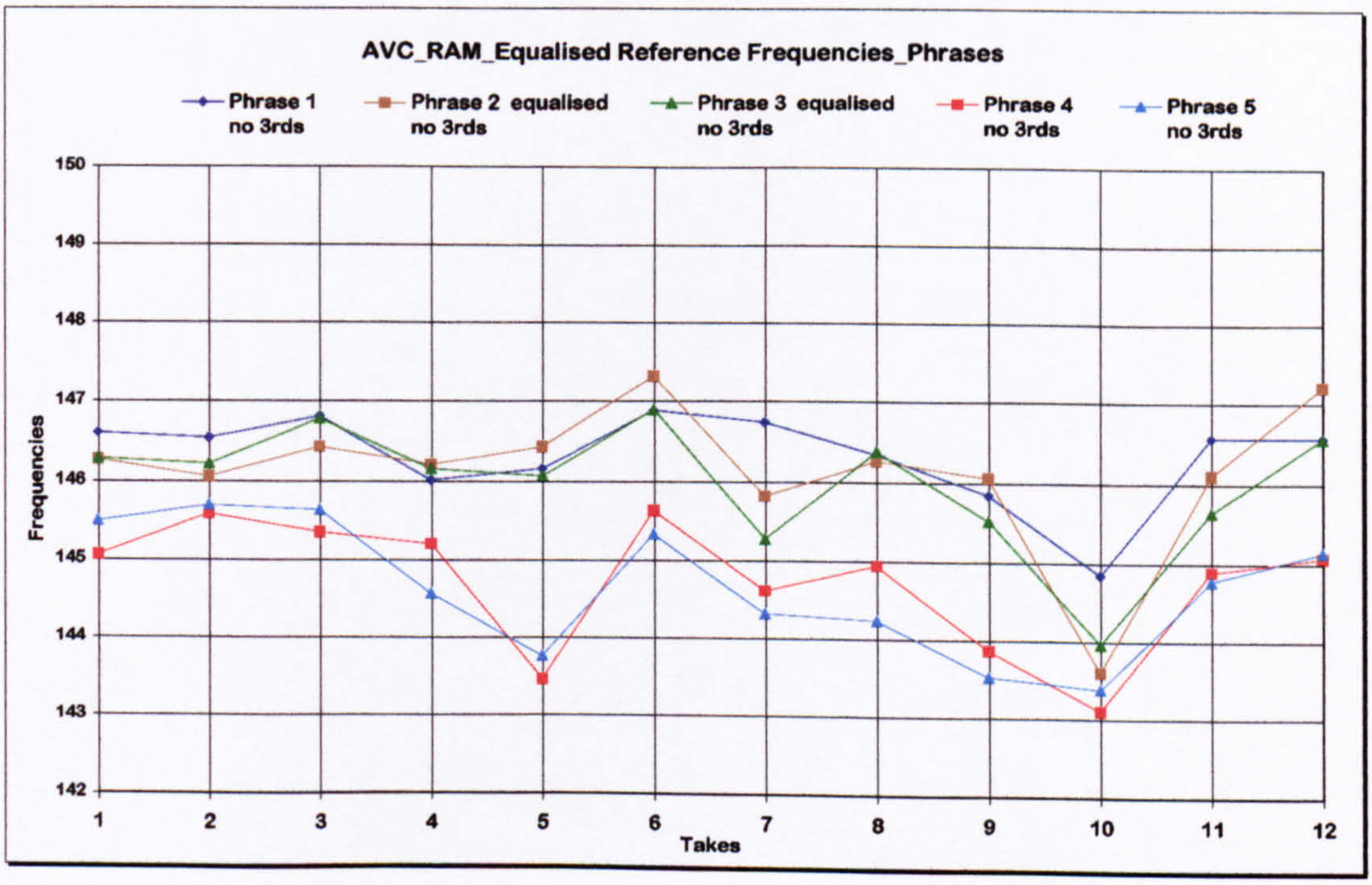

AVC_RAM_Reference Frequencies_Phrases 2 and 3
Phrase 2
with 3rds
Phrase 3
with 3rds
112
111.5
111
110.5
110
109.5
109
108.5
108
107.5
107
Frequencies
1
2
3
4
5
6
7
8
9
10
11
12
Takes


AVC_RAM_Reference Frequencies_Phrases 2 and 3
Phrase 2
no 3rds
Phrase 3
no 3rds
112
111.5
111
110.5
110
109.5
109
108.5
108
107.5
107
Frequencies
1
2
3
4
5
6
7
8
9
10
11
12
Takes


AVC_RAM_Reference Frequencies_Phrases
Phrase 1 with 3rds
Phrase 4 with 3rds
Phrase 5 with 3rds
150
149
148
147
146
145
144
143
142
Frequencies
1
2
3
4
5
6
7
8
9
10
11
12
Takes

AVC_RAM_Reference Frequencies_Phrases
Phrase 1 no 3rds
Phrase 4 no 3rds
Phrase 5 no 3rds
150
149
148
147
146
145
144
143
142
Frequencies
1
2
3
4
5
6
7
8
9
10
11
12
Takes


AVC_RAM_Equalised Reference Frequencies_Phrases
Phrase 1 with 3rds
Phrase 2 equalised with 3rds
Phrase 3 equalised with 3rds
Phrase 4 with 3rds
Phrase 5 with 3rds
150
149
148
147
146
145
144
143
142
Frequencies
1
2
3
4
5
6
7
8
9
10
11
12
Takes


AVC_RAM_Equalised Reference Frequencies_Phrases
Phrase 1 no 3rds
Phrase 2 equalised no 3rds
Phrase 3 equalised no 3rds
Phrase 4 no 3rds
Phrase 5 no 3rds
150
149
148
147
146
145
144
143
142
Frequencies
1
2
3
4
5
6
7
8
9
10
11
12
Takes

APPENDIX 11

11 - MEASUREMENTS RESULTS – THE BBC SINGERS –

AVC_BBC Singers Recording Session_Overview_All

Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
147.030	D	110.067	A	110.428	A	146.873	D	147.153	D

Reference Frequencies with Thirds

Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
146.657	D	109.962	A	110.156	A	146.542	D	147.103	D

Reference Frequencies without Thirds

Frequency Measurements

First Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
Soprano 1 Avg	445.474	593.633	373.574	441.188	420.630	394.835	394.549	497.891	443.548	395.867	394.771	371.549	376.070	331.167	331.809	371.547	371.999	394.347	393.283	395.577	372.348	372.445	331.191
Soprano 2 Avg	442.524	595.798	369.036	440.633	415.897	393.170	394.058	494.361	444.019	395.618	395.673	371.375	373.617	330.132	333.444	369.648	368.080	391.477	390.764	392.731	373.551	371.238	331.083
Soprano 3 Avg	437.671	586.394	368.532	440.390	418.030	388.630	391.991	493.618	438.457	393.922	391.931	369.690	369.739	330.251	331.736	369.803	370.485	391.486	391.080	391.926	370.992	369.824	328.464
Soprano 4 Avg	438.972	584.922	370.274	441.523	419.422	394.044	394.471	491.496	441.041	392.285	391.559	371.857	371.158	330.099	331.917	369.463	369.352	390.600	390.776	390.635	371.250	368.873	329.736
AVERAGE All	**441.160**	**590.187**	**370.354**	**440.934**	**418.495**	**392.670**	**393.767**	**494.342**	**441.766**	**394.423**	**393.483**	**371.118**	**372.646**	**330.412**	**332.226**	**370.116**	**369.979**	**391.977**	**391.476**	**392.717**	**372.035**	**370.595**	**330.118**
Cents RF+3rds	2.236	6.078	-0.641	1.346	10.924	0.652	5.485	-0.718	4.613	8.366	4.236	2.924	10.038	1.794	11.272	-1.757	-2.395	-2.403	-4.620	0.862	7.199	0.484	0.253
Cents RF-3rds	6.632	10.474	3.755	5.742	15.319	5.048	9.880	3.678	9.008	12.761	8.632	7.320	14.433	6.190	15.668	2.639	2.000	1.992	-0.224	5.258	11.595	4.880	4.649
Just Int I	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Just Int II	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Pythagorean	1.955	0.000	7.820	1.955	11.730	-1.955	-1.955	5.865	1.955	-1.955	-1.955	7.820	7.820	3.910	3.910	7.820	7.820	-1.955	-1.955	-1.955	7.820	7.820	3.910
Meantone	-3.421	0.000	-13.686	-3.421	-20.530	3.422	3.422	-10.264	-3.421	3.422	3.422	-13.686	-13.686	-6.843	-6.843	-13.686	-13.686	3.422	3.422	3.422	-13.686	-13.686	-6.843
Alto 1 Avg	369.788	369.845	330.878	329.370	329.034	390.259	370.802	328.949	328.241	293.701	296.252	279.276	279.206	293.973	295.802	328.433	326.360	329.467	294.197	296.295	278.766		
Alto 2 Avg	369.338	367.979	328.008	328.376	329.525	389.667	369.699	329.215	329.443	293.690	291.452	274.309	276.754	292.520	293.402	329.918	328.293	329.740	295.714	295.688	275.199		
Alto 3 Avg	372.442	371.104	331.209	330.203	330.748	396.164	374.384	333.374	331.820	295.351	295.162	278.600	278.995	293.948	294.479	330.962	331.348	331.928	295.998	295.996	278.734		
Alto 4 Avg	368.959	369.479	328.088	328.181	327.045	391.174	370.276	328.304	327.726	291.843	292.696	275.420	275.662	291.198	291.269	329.502	327.532	328.506	291.004	292.289	275.806		
AVERAGE All	**370.132**	**369.602**	**329.546**	**329.032**	**329.088**	**391.816**	**371.290**	**329.961**	**329.308**	**293.646**	**293.891**	**276.901**	**277.654**	**292.910**	**293.738**	**329.704**	**328.383**	**329.910**	**294.228**	**295.067**	**277.126**		
Cents RF+3rds	-1.681	-4.162	-2.753	-5.452	-5.159	-3.116	3.728	-0.574	-4.004	-2.432	-0.992	-4.082	0.620	-6.780	-1.892	-1.924	-8.871	-0.838	0.995	5.923	-2.675		
Cents RF-3rds	2.715	0.234	1.643	-1.056	-0.764	1.279	8.124	3.822	0.392	1.964	3.403	0.314	5.015	-2.384	2.503	2.471	-4.476	3.557	5.391	10.319	1.720		
Just Int I	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731		
Just Int II	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731		
Pythagorean	7.820	7.820	3.910	3.910	3.910	-1.955	7.820	3.910	3.910	0.000	0.000	9.775	9.775	0.000	0.000	3.910	3.910	3.910	0.000	0.000	9.775		
Meantone	-13.686	-13.686	-6.843	-6.843	-6.843	3.422	-13.686	-6.843	-6.843	0.000	0.000	-17.108	-17.108	0.000	0.000	-6.843	-6.843	-6.843	0.000	0.000	-17.108		
Tenor 1 Avg	221.344	221.123	246.231	245.605	221.597	221.495	220.973	220.768	221.573	221.221	222.193	221.514	221.160	220.235	220.785	220.851	220.787						
Tenor 2 Avg	219.613	220.559	246.283	246.219	220.137	220.564	219.840	220.649	219.865	220.870	220.362	220.441	220.922	219.499	221.308	221.677	220.019						
Tenor 3 Avg	216.527	216.038	244.585	243.790	216.856	217.838	218.173	220.389	218.487	218.887	218.505	218.915	220.070	218.309	220.055	219.457	218.467						
Tenor 4 Avg	220.648	220.556	245.746	246.302	219.469	220.208	220.583	222.105	220.141	219.819	219.406	219.861	221.860	219.720	221.699	221.306	220.503						
AVERAGE All	**219.533**	**219.569**	**245.711**	**245.479**	**219.515**	**220.026**	**219.892**	**220.978**	**220.017**	**220.199**	**220.117**	**220.183**	**221.003**	**219.441**	**220.962**	**220.823**	**219.944**						
Cents RF+3rds	-6.001	-5.717	-10.970	-12.607	-6.148	-2.116	-3.170	5.355	-2.193	-0.756	-1.407	-0.886	5.552	-6.728	5.228	4.139	-2.762						
Cents RF-3rds	-1.606	-1.321	-6.574	-8.212	-1.752	2.280	1.226	9.751	2.203	3.639	2.989	3.509	9.947	-2.333	9.623	8.534	1.633						
Just Int I	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995						
Just Int II	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995						
Pythagorean	1.955	1.955	5.865	5.865	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955						
Meantone	-3.421	-3.421	-10.264	-10.264	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421						
Bass 1 Avg	145.634	145.019	145.059	145.844	137.015	138.282	144.954	146.304	109.242	110.313	145.399	145.079	138.799	138.066	147.172	146.817	109.511						
Bass 2 Avg	146.003	146.120	145.641	145.502	138.248	138.285	145.317	146.309	109.204	110.469	146.147	145.957	139.496	138.386	147.082	147.335	109.448						
Bass 3 Avg	146.279	147.492	146.525	146.428	139.039	140.077	146.605	147.186	109.634	110.672	146.429	145.913	140.585	139.274	147.949	147.047	109.521						
Bass 4 Avg	146.711	147.440	146.760	146.442	139.983	140.619	147.826	148.910	109.819	109.429	148.566	146.812	140.905	139.809	148.835	148.644	109.613						
AVERAGE All	**146.157**	**146.518**	**145.996**	**146.054**	**138.571**	**139.316**	**146.176**	**147.177**	**109.475**	**110.221**	**146.635**	**145.940**	**139.946**	**138.884**	**147.759**	**147.461**	**109.523**						
Cents RF+3rds	-10.310	-6.037	-12.213	-11.524	-2.574	6.700	-10.085	1.737	-10.608	1.148	-4.647	-12.871	14.521	1.327	8.573	5.069	-9.839						
Cents RF-3rds	-5.915	-1.641	-7.817	-7.129	1.822	11.096	-5.689	6.132	-6.213	5.544	-0.251	-8.476	18.917	5.722	12.969	9.465	-5.444						

Just Int I	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995			
Just Int II	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995			
Pythagorean	0.000	0.000	0.000	0.000	9.775	9.775	0.000	0.000	1.955	1.955	0.000	0.000	9.775	9.775	0.000	0.000	1.955			
Meantone	0.000	0.000	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421	-3.421	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421			
Second Phrase																				
	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
Soprano 1 Avg	331.593	443.276	439.610	418.284	419.040	333.766	418.769	499.118	498.460	443.424	442.502	443.451	593.959	559.039	498.386	442.856	444.918	420.072	421.752	443.288
Soprano 2 Avg	329.636	440.472	439.182	413.536	413.466	331.383	416.864	494.764	492.443	439.706	441.553	441.134	593.137	562.580	496.422	440.696	439.659	417.236	418.418	443.379
Soprano 3 Avg	328.732	438.039	440.381	414.643	414.446	331.157	417.216	493.763	491.760	437.511	439.011	440.202	591.395	556.937	491.921	439.086	439.367	416.662	417.058	438.049
Soprano 4 Avg	330.012	438.310	440.206	418.595	415.990	330.418	416.586	492.203	490.802	439.438	439.005	440.441	590.182	557.430	491.009	440.201	440.339	419.415	418.021	440.284
AVERAGE All	**329.993**	**440.024**	**439.845**	**416.265**	**415.736**	**331.681**	**417.359**	**494.962**	**493.366**	**440.020**	**440.518**	**441.307**	**592.168**	**558.996**	**494.434**	**440.710**	**441.071**	**418.346**	**418.812**	**441.250**
Cents RF+3rds	0.869	-0.955	-1.662	2.946	0.744	9.701	7.490	2.726	-2.865	-0.973	0.985	4.084	13.154	13.351	0.879	1.739	3.156	11.581	13.510	3.859
Cents RF-3rds	2.521	0.697	-0.010	4.598	2.397	11.353	9.143	4.378	-1.212	0.680	2.638	5.736	14.806	15.004	2.531	3.391	4.809	13.234	15.163	5.512
Just Int I	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	-44.860	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Just Int II	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	3.910	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	1.955	0.000	0.000	9.775	9.775	1.955	9.775	3.910	3.910	0.000	0.000	0.000	-1.955	7.820	3.910	0.000	0.000	9.775	9.775	0.000
Meantone	-3.421	0.000	0.000	-17.108	-17.108	-3.421	-17.108	-6.843	-6.843	0.000	0.000	0.000	3.422	-13.686	-6.843	0.000	0.000	-17.108	-17.108	0.000
Alto 1 Avg	330.927	327.286	330.315	332.033	333.827	415.117	417.361	439.420	440.876	414.701	441.662	371.083	372.659	330.262	330.709	330.233				
Alto 2 Avg	327.770	329.570	328.742	329.112	331.447	416.211	416.706	435.888	437.167	414.484	439.424	368.852	369.565	329.655	329.885	330.147				
Alto 3 Avg	330.459	330.626	330.630	332.707	333.156	421.133	419.393	442.766	440.892	422.697	445.229	370.939	371.783	331.207	332.154	330.398				
Alto 4 Avg	328.280	327.043	328.148	330.252	332.037	416.320	415.713	440.426	442.666	418.424	444.313	369.098	369.322	329.467	329.927	328.197				
AVERAGE All	**329.359**	**328.631**	**329.459**	**331.026**	**332.617**	**417.195**	**417.293**	**439.625**	**440.400**	**417.577**	**442.657**	**369.993**	**370.832**	**330.148**	**330.669**	**329.744**				
Cents RF+3rds	-2.462	-6.292	-1.937	6.278	14.578	6.812	7.219	-2.527	0.524	8.394	9.372	-1.058	2.865	1.680	4.410	-0.441				
Cents RF-3rds	-0.809	-4.640	-0.285	7.930	16.230	8.465	8.872	-0.875	2.176	10.047	11.025	0.594	4.517	3.332	6.063	1.212				
Just Int I	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995				
Just Int II	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995				
Pythagorean	1.955	1.955	1.955	1.955	1.955	9.775	9.775	0.000	0.000	9.775	0.000	5.865	5.865	1.955	1.955	1.955				
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-17.108	-17.108	0.000	0.000	-17.108	0.000	-10.264	-10.264	-3.421	-3.421	-3.421				
Tenor 1 Avg	275.773	276.413	276.255	292.783	293.766	246.359	290.989	291.157	275.498	275.427	293.326	329.090	293.135	277.032	246.745	248.111	276.215			
Tenor 2 Avg	275.408	276.180	276.841	292.731	293.877	247.931	292.043	292.244	276.083	276.959	292.745	331.189	293.634	276.816	247.124	248.027	276.323			
Tenor 3 Avg	274.020	274.289	274.488	288.812	291.903	246.105	289.049	290.255	273.457	274.892	292.066	326.656	290.723	274.966	245.291	246.847	275.452			
Tenor 4 Avg	276.364	276.510	277.228	293.096	294.044	248.367	291.843	293.182	275.848	278.810	292.292	332.746	293.159	276.496	246.789	249.396	278.080			
AVERAGE All	**275.391**	**275.848**	**276.203**	**291.856**	**293.398**	**247.190**	**290.981**	**291.709**	**275.221**	**276.522**	**292.607**	**329.920**	**292.663**	**276.328**	**246.487**	**248.095**	**276.518**			
Cents RF+3rds	-12.275	-9.407	-7.179	-11.749	-2.627	0.692	-16.944	-12.617	-13.344	-5.183	-7.296	0.484	-6.968	-6.399	-4.241	7.017	-5.210			
Cents RF-3rds	-10.623	-7.755	-5.527	-10.097	-0.974	2.345	-15.292	-10.964	-11.691	-3.531	-5.644	2.137	-5.316	-4.747	-2.588	8.669	-3.557			
Just Int I	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-8.731	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686			
Just Int II	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-29.219	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686			
Pythagorean	7.820	7.820	7.820	-1.955	-1.955	3.910	-1.955	-1.955	7.820	7.820	-1.955	1.955	-1.955	7.820	3.910	3.910	7.820			
Meantone	-13.686	-13.686	-13.686	3.422	3.422	-6.843	3.422	3.422	-13.686	-13.686	3.422	-3.421	3.422	-13.686	-6.843	-6.843	-13.686			
Bass 1 Avg	220.825	220.777	219.785	247.682	249.997	164.995	163.257	172.071	183.358	186.224	123.425	137.723	146.008	146.562	164.059	165.416	110.003			
Bass 2 Avg	218.573	218.926	219.968	245.447	246.601	164.118	164.572	172.823	182.240	183.589	122.311	138.549	146.339	146.824	164.106	165.037	109.638			
Bass 3 Avg	219.933	219.625	219.848	243.966	247.725	163.532	165.534	173.315	183.070	184.672	122.906	139.605	147.022	147.179	165.089	165.607	109.793			
Bass 4 Avg	220.678	220.467	221.588	251.390	252.990	166.064	163.712	175.191	184.876	186.135	123.109	140.621	147.592	146.723	165.610	165.744	109.600			
AVERAGE All	**220.002**	**219.949**	**220.297**	**247.121**	**249.328**	**164.677**	**164.269**	**173.350**	**183.386**	**185.155**	**122.938**	**139.124**	**146.740**	**146.822**	**164.716**	**165.451**	**109.759**			
Cents RF+3rds	-1.034	-1.455	1.286	0.208	15.601	-2.487	-6.787	-13.631	-16.192	0.424	-8.541	5.595	-2.138	-1.172	-2.076	5.632	-4.855			
Cents RF-3rds	0.619	0.197	2.938	1.860	17.253	-0.835	-5.134	-11.979	-14.540	2.077	-6.889	7.247	-0.485	0.480	-0.424	7.284	-3.203			
Just Int I	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000			
Just Int II	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000			
Pythagorean	0.000	0.000	0.000	3.910	3.910	1.955	1.955	15.640	5.865	5.865	3.910	7.820	-1.955	-1.955	1.955	1.955	0.000			
Meantone	0.000	0.000	0.000	-6.843	-6.843	-3.421	-3.421	-27.373	-10.264	-10.264	-6.843	-13.686	3.422	3.422	-3.421	-3.421	0.000			
Third Phrase																				
	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
Soprano 1 Avg	446.049	446.445	442.885	468.125	469.413	470.865	593.289	524.509	469.601	466.966	439.952	444.877	397.025	395.867	398.513	471.432	444.589	394.893	393.765	350.548	332.609	354.641	330.343

Soprano 2 Avg	445.311	443.583	442.661	463.653	467.298	467.108	589.662	522.881	467.432	466.440	443.935	443.851	393.487	391.843	394.891	466.472	442.526	390.885	390.619	349.318	330.948	351.306	330.815
Soprano 3 Avg	440.340	441.763	441.862	460.290	464.310	464.674	583.219	518.868	467.324	462.581	437.065	438.051	393.835	391.948	395.291	462.425	437.237	387.195	388.883	345.873	327.416	347.109	328.134
Soprano 4 Avg	441.059	440.859	440.465	462.623	461.363	461.288	580.730	519.782	462.344	461.100	438.483	440.919	392.659	395.201	393.170	462.228	439.041	388.450	390.133	348.919	329.247	349.038	328.939
AVERAGE All	443.190	443.163	441.968	463.673	465.596	465.984	586.725	521.510	466.675	464.272	439.859	441.925	394.252	393.715	395.466	465.639	440.848	390.356	390.850	348.665	330.055	350.524	329.558
Cents RF+3rds	5.784	5.678	1.006	-15.997	-8.831	-7.390	-8.504	-12.492	-4.823	-13.761	-7.277	0.836	3.215	0.856	8.541	-8.670	-3.387	-13.979	-11.787	-9.516	-4.477	-0.311	-7.087
Cents RF-3rds	10.048	9.942	5.269	-11.733	-4.568	-3.126	-4.240	-8.228	-0.560	-9.498	-3.013	5.100	7.479	5.119	12.804	-4.406	0.877	-9.715	-7.524	-5.253	-0.213	3.952	-2.824
Just Int I	0.000	0.000	0.000	4.955	4.955	-37.039	-1.955	7.820	-37.039	-37.039	-21.506	-21.506	-25.416	-25.416	-52.680	-9.774	-21.506	-52.680	-52.680	-7.820	-19.551	-14.596	-19.551
Just Int II	0.000	0.000	0.000	4.955	4.955	-15.532	19.551	29.326	-15.532	-15.532	0.000	0.000	-3.910	-3.910	-31.174	11.732	0.000	-31.174	-31.174	13.686	1.955	6.910	1.955
Pythagorean	0.000	0.000	0.000	-9.775	-9.775	-9.775	-1.955	-5.865	-9.775	-9.775	0.000	0.000	-3.910	-3.910	-3.910	-9.775	0.000	-3.910	-3.910	-7.820	1.955	-7.820	1.955
Meantone	0.000	0.000	0.000	17.107	17.107	17.107	3.422	10.265	17.107	17.107	0.000	0.000	6.843	6.843	6.843	17.107	0.000	6.843	6.843	13.686	1.955	13.686	1.955
Alto 1 Avg	332.897	332.491	332.032	332.450	328.294	328.399	330.183	346.600	350.347	295.549	296.019	332.492	351.799	330.785	328.637	328.829	293.370	279.953	294.978	278.323			
Alto 2 Avg	330.878	330.982	329.603	330.881	328.940	328.215	327.749	342.641	346.050	293.541	295.954	329.520	348.466	332.267	330.909	329.680	294.179	280.554	295.304	276.674			
Alto 3 Avg	333.556	332.605	330.554	331.357	329.847	330.017	330.443	348.385	349.376	296.018	295.373	331.811	352.325	332.026	330.160	329.583	295.069	281.306	296.074	279.181			
Alto 4 Avg	332.687	329.908	328.980	331.223	329.993	328.283	328.972	347.303	349.397	292.463	292.385	329.299	348.625	329.476	326.959	327.894	291.359	277.708	292.743	275.107			
AVERAGE All	332.505	331.497	330.292	331.478	329.268	328.728	329.337	346.232	348.792	294.393	294.933	330.780	350.304	331.138	329.166	328.996	293.494	279.880	294.775	277.321			
Cents RF+3rds	8.324	3.067	-3.235	2.969	-8.609	-11.450	-8.248	-21.636	-8.883	-2.434	0.738	-0.678	-1.398	1.196	-9.147	-10.039	-7.727	10.047	-0.190	-5.855			
Cents RF-3rds	12.588	7.331	1.029	7.233	-4.345	-7.186	-3.985	-17.373	-4.620	1.829	5.001	3.586	2.866	5.460	-4.883	-5.775	-3.463	14.311	4.074	-1.591			
Just Int I	1.955	1.955	1.955	1.955	-19.552	-19.552	-19.552	-7.819	-7.819	-23.461	-23.461	-19.551	-7.820	-19.551	-19.551	-19.551	-23.461	-35.192	-50.725	-35.192			
Just Int II	1.955	1.955	1.955	1.955	1.954	1.954	1.954	13.687	13.687	-1.955	-1.955	1.955	13.686	1.955	1.955	1.955	-1.955	-13.686	-29.219	-13.686			
Pythagorean	1.955	1.955	1.955	1.955	1.955	1.955	1.955	-7.820	-7.820	-1.955	-1.955	1.955	-7.820	1.955	1.955	1.955	-1.955	7.820	-1.955	7.820			
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	13.686	13.686	3.422	3.422	-3.421	13.686	-3.421	-3.421	-3.421	3.422	-13.686	3.422	-13.686			
Tenor 1 Avg	279.604	277.547	277.542	277.696	263.152	260.853	232.501	219.641	195.976	195.566	220.057	220.572	247.981	247.514	277.817	293.422	330.705	276.583	276.496	292.042	245.681	164.035	
Tenor 2 Avg	278.679	278.488	276.184	277.673	262.202	259.996	229.930	218.879	194.646	195.183	218.026	220.107	247.841	246.217	277.848	293.653	328.385	275.510	276.512	292.648	247.916	164.012	
Tenor 3 Avg	277.526	275.373	273.897	276.100	260.485	257.913	229.173	216.073	192.547	193.166	216.748	218.770	247.900	245.121	277.906	291.745	329.069	277.420	275.173	289.236	246.210	162.793	
Tenor 4 Avg	279.761	277.352	275.832	278.427	263.135	261.335	230.540	217.343	193.196	192.963	217.444	219.776	248.478	247.070	276.854	292.064	328.914	277.594	275.279	290.052	246.639	164.170	
AVERAGE All	278.892	277.190	275.864	277.474	262.244	260.024	230.536	217.984	194.092	194.219	218.069	219.806	248.050	246.480	277.606	292.721	329.268	276.776	275.865	290.995	246.612	163.753	
Cents RF+3rds	3.924	-6.675	-14.978	-4.903	-2.636	-17.352	-25.736	-22.657	-23.641	-22.501	-21.986	-8.249	1.032	-9.957	-4.077	-12.294	-8.610	-9.260	-14.971	-22.534	-9.037	-17.904	
Cents RF-3rds	8.188	-2.411	-10.714	-0.639	1.628	-13.088	-21.472	-18.393	-19.377	-18.237	-17.722	-3.985	5.295	-5.694	0.186	-8.030	-4.347	-4.996	-10.708	-18.270	-4.773	-13.641	
Just Int I	-13.686	-13.686	-13.686	-13.686	7.820	7.820	-37.039	-21.506	-3.910	-3.910	-21.506	-21.506	-39.102	-39.102	-35.192	-19.551	-19.551	-35.192	-35.192	-23.461	-17.596	-19.551	
Just Int II	-13.686	-13.686	-13.686	-13.686	29.326	29.326	-15.532	0.000	17.596	17.596	0.000	0.000	-17.596	-17.596	-13.686	-1.955	1.955	-13.686	-13.686	-1.955	3.910	1.955	
Pythagorean	7.820	7.820	7.820	7.820	-5.865	-5.865	4.955	0.000	-3.910	-3.910	0.000	0.000	3.910	3.910	7.820	-1.955	1.955	7.820	7.820	-1.955	3.910	1.955	
Meantone	-13.686	-13.686	-13.686	-13.686	10.265	10.265	17.107	0.000	6.843	6.843	0.000	0.000	-6.843	-6.843	-13.686	3.422	-3.421	-13.686	-13.686	3.422	-6.843	-3.421	
Bass 1 Avg	221.385	222.340	220.090	195.634	197.747	128.496	128.920	129.626	173.095	176.796	175.028	173.569	164.333	144.647	138.140	110.444	116.878	108.929	104.304	108.800			
Bass 2 Avg	220.892	220.175	219.863	194.170	195.266	129.793	129.571	130.271	173.190	174.658	173.818	172.423	164.734	147.072	138.840	108.823	115.737	109.669	104.424	109.147			
Bass 3 Avg	221.733	221.186	218.706	194.789	195.496	129.736	129.670	130.010	173.369	176.267	175.693	173.869	165.906	146.622	139.224	109.127	115.338	109.225	104.245	109.334			
Bass 4 Avg	223.437	222.145	220.759	195.911	196.804	129.683	130.917	130.180	174.737	179.101	176.101	174.405	165.164	146.927	139.327	107.761	116.168	109.064	104.016	110.133			
AVERAGE All	221.862	221.461	219.854	195.126	196.328	129.427	129.770	130.022	173.598	176.705	175.160	173.566	165.034	146.317	138.883	109.039	116.030	109.222	104.247	109.353			
Cents RF+3rds	7.867	4.741	-7.866	-14.436	-3.804	-25.156	-20.580	-17.219	-16.828	13.890	-1.317	-17.139	-4.407	-12.806	-3.085	-21.916	-14.324	-19.012	0.285	-16.928			
Cents RF-3rds	12.131	9.004	-3.603	-10.173	0.460	-20.892	-16.317	-12.956	-12.564	18.153	2.947	-12.876	-0.144	-8.542	1.179	-17.652	-10.061	-14.749	4.548	-12.665			
Just Int I	0.000	0.000	0.000	-31.174	-31.174	7.820	7.820	7.820	-7.819	-7.819	-56.590	-56.590	-19.551	-19.551	-35.192	-21.506	-16.551	-21.506	-33.237	-21.506			
Just Int II	0.000	0.000	0.000	-31.174	-31.174	29.326	29.326	29.326	13.687	13.687	-35.084	-35.084	1.955	-1.955	-13.686	0.000	4.955	0.000	-11.731	0.000			
Pythagorean	0.000	0.000	0.000	-3.910	-3.910	-5.865	-5.865	-5.865	-7.820	-7.820	-7.820	-7.820	1.955	-1.955	7.820	0.000	-9.775	0.000	9.775	0.000			
Meantone	0.000	0.000	0.000	6.843	6.843	10.265	10.265	10.265	13.686	13.686	13.686	13.686	-3.421	3.422	-13.686	0.000	17.107	0.000	-17.108	0.000			

Fourth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
Soprano 1 Avg	370.140	370.874	369.893	330.896	298.563	397.974	394.372	398.444	392.756	374.185	334.827	442.933	444.220	394.242	444.498	502.925	371.215	330.919	373.959	394.915
Soprano 2 Avg	368.995	368.479	370.216	329.829	295.080	392.353	392.416	393.298	392.719	370.743	330.113	445.195	442.021	392.686	443.644	495.548	368.586	329.841	371.847	393.621
Soprano 3 Avg	366.576	370.889	368.496	328.742	296.414	393.627	389.607	391.607	393.501	371.319	328.518	442.471	440.552	391.130	440.368	493.148	369.929	331.143	371.440	388.553
Soprano 4 Avg	367.162	369.425	366.555	330.292	298.074	389.556	392.546	393.217	391.035	372.481	335.254	437.750	439.800	395.457	440.858	495.645	369.757	332.182	371.317	390.977
AVERAGE All	368.218	369.917	368.790	329.940	297.033	393.377	392.235	394.142	392.503	372.182	332.178	442.087	441.648	393.379	442.342	496.816	369.872	331.021	372.141	392.017
Cents RF+3rds	-8.806	-0.837	-6.121	1.164	19.267	5.618	0.583	8.977	1.763	9.730	12.869	7.718	5.997	5.623	8.715	9.776	-1.050	6.828	9.539	-0.382
Cents RF-3rds	-4.902	3.067	-2.216	5.069	23.172	9.522	4.488	12.882	5.668	13.635	16.774	11.623	9.902	9.528	12.620	13.680	2.855	10.733	13.444	3.523
Just Int I	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Just Int II	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955

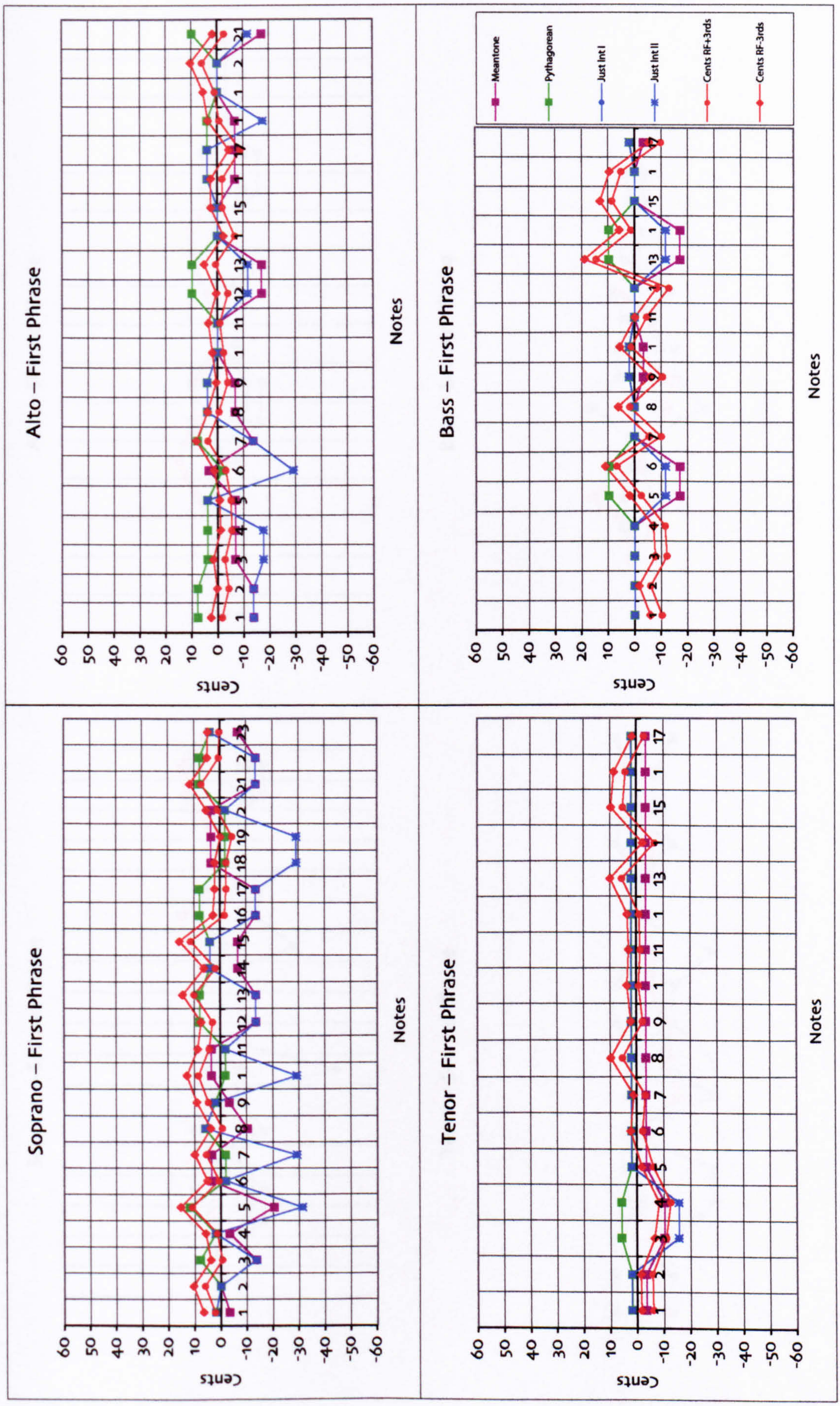
Pythagorean	7.820	7.820	7.820	3.910	0.000	-1.955	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	-1.955	1.955	5.865	7.820	3.910	7.820	-1.955
Meantone	-13.686	-13.686	-13.686	-6.843	0.000	3.422	3.422	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	3.422	-3.421	-10.264	-13.686	-6.843	-13.686	3.422
Alto 1 Avg	294.925	294.952	295.200	280.789	251.095	331.127	329.837	329.804	328.770	295.063	281.462	371.738	369.044	391.369	369.235	325.135	294.370	278.076	279.584	293.831
Alto 2 Avg	293.451	296.016	295.148	277.534	247.110	331.346	329.022	329.565	327.861	291.586	278.361	370.810	368.413	388.195	367.974	328.912	293.806	276.326	278.002	290.758
Alto 3 Avg	295.006	294.398	295.241	279.732	248.237	331.951	330.768	331.682	330.138	296.068	281.113	373.754	372.372	393.868	375.072	330.545	295.229	279.270	280.588	295.291
Alto 4 Avg	292.909	293.108	292.174	276.170	246.233	330.540	328.410	328.068	327.320	291.139	276.677	368.740	370.084	390.671	369.839	326.008	290.962	275.543	276.191	291.274
AVERAGE All	294.073	294.619	294.441	278.556	248.169	331.241	329.509	329.780	328.522	293.464	279.403	371.261	369.978	391.026	370.530	327.650	293.592	277.304	278.591	292.789
Cents RF+3rds	1.929	5.140	4.093	8.082	8.106	7.977	-1.096	0.324	-6.290	-1.659	13.338	5.439	-0.551	-4.764	2.030	-10.893	-0.905	0.282	8.301	-5.648
Cents RF-3rds	5.833	9.044	7.998	11.987	12.011	11.881	2.808	4.228	-2.386	2.246	17.243	9.344	3.354	-0.859	5.934	-6.988	2.999	4.187	12.206	-1.744
Just Int I	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Just Int II	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Pythagorean	0.000	0.000	0.000	9.775	5.865	3.910	3.910	3.910	3.910	0.000	9.775	7.820	7.820	-1.955	7.820	3.910	0.000	9.775	9.775	0.000
Meantone	0.000	0.000	0.000	-17.108	-10.264	-6.843	-6.843	-6.843	-6.843	0.000	-17.108	-13.686	-13.686	3.422	-13.686	-6.843	0.000	-17.108	-17.108	0.000
Tenor 1 Avg	247.669	247.272	247.976	220.500	197.671	278.352	275.979	277.767	276.664	246.159	222.225	294.862	292.511	295.592	294.669	220.543	219.756	196.561		
Tenor 2 Avg	246.474	246.193	246.171	218.861	196.036	277.585	275.486	277.338	275.283	245.776	220.904	294.294	292.671	297.760	296.015	219.753	219.935	195.626		
Tenor 3 Avg	244.234	244.350	244.307	216.200	194.537	274.365	273.197	274.651	273.828	244.219	218.101	291.623	291.166	294.963	292.343	218.197	218.431	192.828		
Tenor 4 Avg	245.536	245.960	246.148	219.172	196.990	279.944	276.071	278.401	275.520	246.306	221.718	295.114	292.142	296.404	292.838	220.125	221.162	195.503		
AVERAGE All	245.978	245.944	246.150	218.683	196.309	277.561	275.183	277.039	275.324	245.615	220.737	293.973	292.123	296.180	293.966	219.654	219.821	195.130		
Cents RF+3rds	-7.244	-7.485	-6.031	-10.871	2.269	1.889	-13.009	-1.372	-12.124	-9.801	5.315	1.341	-9.590	14.288	1.300	-3.196	-1.886	-8.161		
Cents RF-3rds	-3.339	-3.581	-2.127	-6.966	6.173	5.794	-9.105	2.533	-8.219	-5.896	9.220	5.246	-5.685	18.192	5.205	0.708	2.019	-4.256		
Just Int I	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955		
Just Int II	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955		
Pythagorean	5.865	5.865	5.865	1.955	-1.955	9.775	9.775	9.775	9.775	5.865	1.955	0.000	0.000	0.000	0.000	1.955	1.955	-1.955		
Meantone	-10.264	-10.264	-10.264	-3.421	-29.219	-17.108	-17.108	-17.108	-17.108	-10.264	-3.421	0.000	0.000	0.000	0.000	-3.421	-3.421	3.422		
Bass 1 Avg	195.427	196.976	196.667	184.475	164.852	221.702	220.610	220.781	219.897	196.157	184.671	247.872	247.677	222.776	207.952	220.237	109.241	122.921		
Bass 2 Avg	194.036	196.463	195.458	184.090	165.317	220.340	217.794	218.843	217.801	194.027	185.229	245.828	245.055	221.106	207.397	218.583	109.262	122.295		
Bass 3 Avg	193.269	195.151	194.450	184.552	165.554	220.093	218.445	218.394	216.588	193.104	185.148	245.027	243.870	220.565	207.100	218.930	108.518	122.353		
Bass 4 Avg	194.728	195.583	195.353	184.321	165.438	221.543	219.645	220.727	219.041	193.790	186.963	248.362	247.632	222.218	208.556	221.516	109.239	123.482		
AVERAGE All	194.365	196.043	195.482	184.360	165.290	220.919	219.123	219.686	218.332	194.269	185.503	246.772	246.059	221.666	207.751	219.817	109.065	122.763		
Cents RF+3rds	-14.957	-0.072	-5.037	-6.453	4.523	6.745	-7.388	-2.946	-13.655	-15.808	4.250	-1.663	-6.678	12.587	0.350	-1.919	-15.253	-10.434		
Cents RF-3rds	-11.053	3.833	-1.132	-2.548	8.427	10.650	-3.483	0.959	-9.750	-11.904	8.154	2.241	-2.773	16.492	4.254	1.985	-11.348	-6.529		
Just Int I	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641		
Just Int II	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641		
Pythagorean	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	1.955	1.955	-1.955	7.820	5.865	5.865	1.955	11.730	1.955	1.955	5.865		
Meantone	-29.219	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	-3.421	-3.421	-29.219	-13.686	-10.264	-10.264	-3.421	-20.530	-3.421	3.421	-15.641		

Fifth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16
Soprano 1 Avg	397.711	595.740	629.217	664.481	498.580	560.746	593.889	563.125	498.434	447.808	596.622	395.886	372.475	331.079	332.636	293.285
Soprano 2 Avg	395.077	590.715	622.925	661.985	493.501	559.718	591.969	561.510	495.855	440.512	596.462	393.644	370.428	329.843	332.130	293.686
Soprano 3 Avg	395.678	590.376	621.568	655.759	498.626	557.261	585.839	555.788	495.542	440.761	588.397	390.714	368.860	327.744	328.714	294.560
Soprano 4 Avg	394.563	589.433	616.804	655.141	492.563	558.444	585.478	556.362	492.678	437.545	585.650	390.988	369.773	329.872	327.987	295.757
AVERAGE All	395.757	591.566	622.629	659.341	495.818	559.042	589.294	559.196	495.627	441.656	591.783	392.808	370.384	329.635	330.367	294.322
Cents RF+3rds	12.763	8.671	-2.730	-3.545	2.995	10.773	2.008	11.250	2.330	2.733	9.305	-0.188	-1.950	-3.734	0.106	0.099
Cents RF-3rds	13.342	9.250	-2.151	-2.966	3.574	11.353	2.588	11.829	2.909	3.312	9.884	0.392	-1.371	-3.155	0.685	0.679
Just Int I	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Just Int II	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Pythagorean	-1.955	0.000	13.685	3.910	5.865	9.775	0.000	9.775	5.865	1.955	0.000	-1.955	7.820	3.910	3.910	0.000
Meantone	3.422	0.000	-23.951	-6.843	-10.264	-17.108	0.000	-17.108	-10.264	-3.421	0.000	3.422	-13.686	-6.843	-6.843	0.000
Alto 1 Avg	370.937	389.532	369.914	330.440	294.305	277.090	297.766	296.783	295.430	278.934	278.844	294.176				
Alto 2 Avg	371.149	391.352	368.702	329.884	291.450	277.986	295.328	294.771	294.389	275.356	278.178	293.229				
Alto 3 Avg	375.606	393.633	372.192	332.387	296.497	281.128	295.775	296.246	295.655	280.464	281.560	295.942				
Alto 4 Avg	372.998	391.940	371.629	329.378	292.577	277.145	293.688	293.480	293.151	276.158	276.628	292.146				
AVERAGE All	372.673	391.614	370.609	330.522	293.707	278.337	295.639	295.320	294.656	277.728	278.803	293.873				
Cents RF+3rds	8.714	-5.457	-0.898	0.920	-3.522	3.424	7.830	5.958	2.063	-0.368	6.317	-2.543				

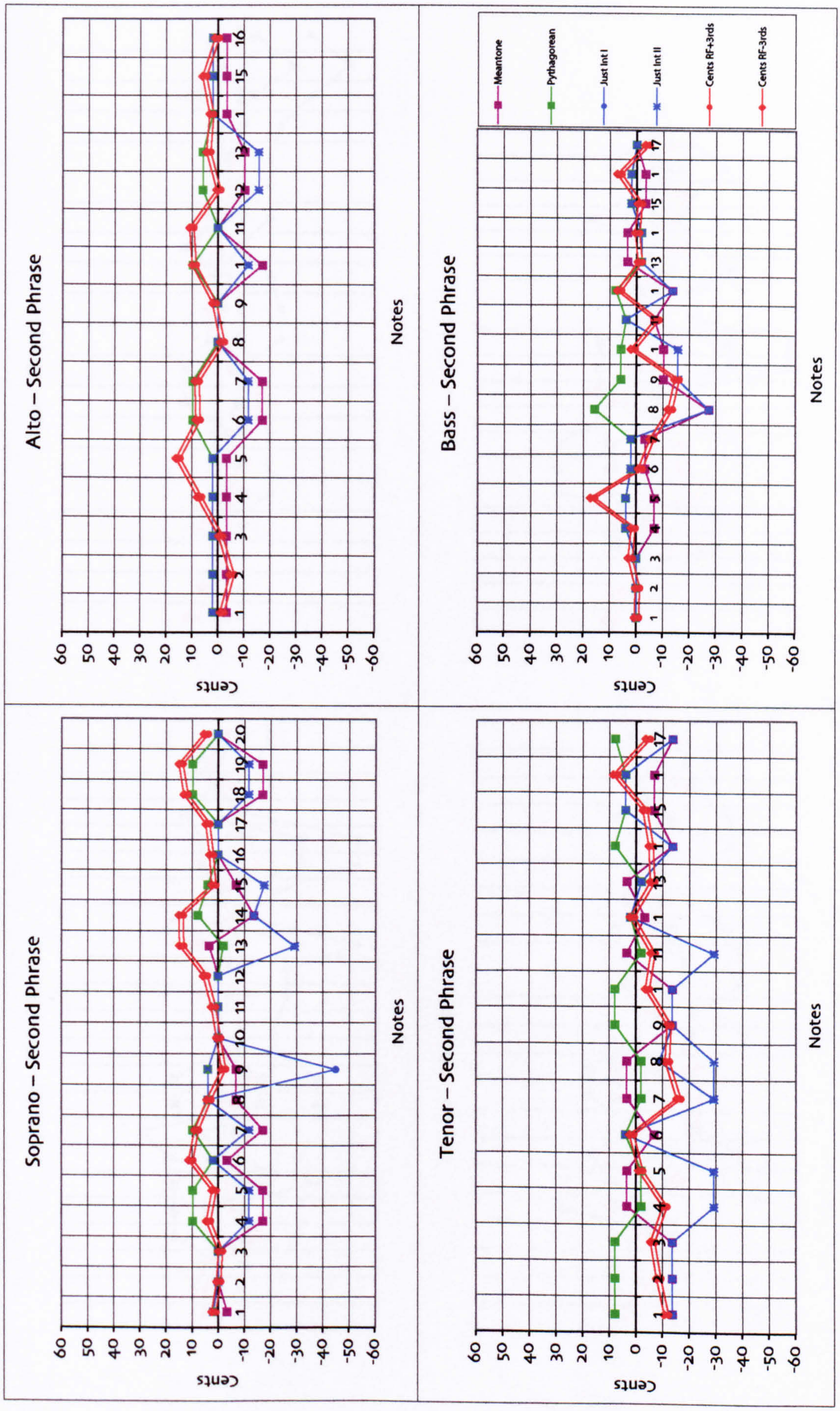
Cents RF-3rds	9.294	-4.877	-0.318	1.500	-2.943	4.004	8.409	6.538	2.642	0.211	6.896	-1.964		
Just Int I	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000		
Just Int II	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000		
Pythagorean	7.820	-1.955	7.820	3.910	0.000	9.775	0.000	0.000	0.000	9.775	9.775	0.000		
Meantone	-13.686	3.422	-13.686	-6.843	0.000	-17.108	0.000	0.000	0.000	-17.108	-17.108	0.000		
Tenor 1 Avg	261.681	293.826	261.811	248.252	292.015	275.133	246.239	220.768	219.852	197.823	220.661	195.525	195.262	186.242
Tenor 2 Avg	263.023	294.890	261.481	248.105	291.685	277.264	246.963	220.052	220.584	195.216	220.347	195.942	196.739	185.291
Tenor 3 Avg	263.311	292.796	261.250	246.704	289.985	274.828	245.087	216.866	219.096	195.637	218.674	193.609	195.917	184.501
Tenor 4 Avg	263.856	294.941	263.418	247.774	292.894	276.692	245.647	219.184	223.064	195.114	220.145	195.982	197.921	186.395
AVERAGE All	**262.968**	**294.113**	**261.990**	**247.709**	**291.645**	**275.979**	**245.984**	**219.218**	**220.649**	**195.948**	**219.957**	**195.264**	**196.460**	**185.607**
Cents RF+3rds	5.087	-1.131	-1.362	1.597	-15.721	-11.305	-10.497	-9.940	1.327	-4.215	-4.110	-10.261	0.304	1.927
Cents RF-3rds	5.666	-0.552	-0.783	2.177	-15.141	-10.726	-9.917	-9.360	1.907	-3.635	-3.530	-9.681	0.883	2.506
Just Int I	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Just Int II	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Pythagorean	-3.910	0.000	-3.910	5.865	0.000	9.775	5.865	1.955	1.955	-1.955	1.955	-1.955	-1.955	7.820
Meantone	6.843	0.000	6.843	-10.264	0.000	-17.108	-10.264	-3.421	-3.421	3.422	-3.421	3.422	3.422	-13.686
Bass 1 Avg	220.348	232.570	220.072	207.255	196.375	187.370	123.897	109.519	110.036	146.835				
Bass 2 Avg	220.285	233.183	219.490	206.344	194.498	186.563	122.904	109.578	109.806	146.580				
Bass 3 Avg	219.521	230.423	217.878	205.233	194.222	186.540	122.424	109.098	108.863	146.642				
Bass 4 Avg	221.802	233.815	220.615	209.571	196.453	186.979	123.603	109.726	109.810	147.079				
AVERAGE All	**220.489**	**232.498**	**219.514**	**207.101**	**195.387**	**186.863**	**123.207**	**109.480**	**109.629**	**146.784**				
Cents RF+3rds	0.070	-8.116	-7.603	-8.375	-9.177	13.603	-7.474	-11.971	-9.622	-4.341				
Cents RF-3rds	0.650	-7.537	-7.023	-7.796	-8.597	14.182	-6.894	-11.392	-9.042	-3.762				
Just Int I	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000				
Just Int II	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000				
Pythagorean	1.955	-7.820	1.955	11.730	-1.955	7.820	5.865	1.955	1.955	0.000				
Meantone	-3.421	13.686	-3.421	-20.530	3.422	-13.686	-10.264	-3.421	-3.421	0.000				

11.1 - THE BBC SINGERS SECTIONS' RESULTS



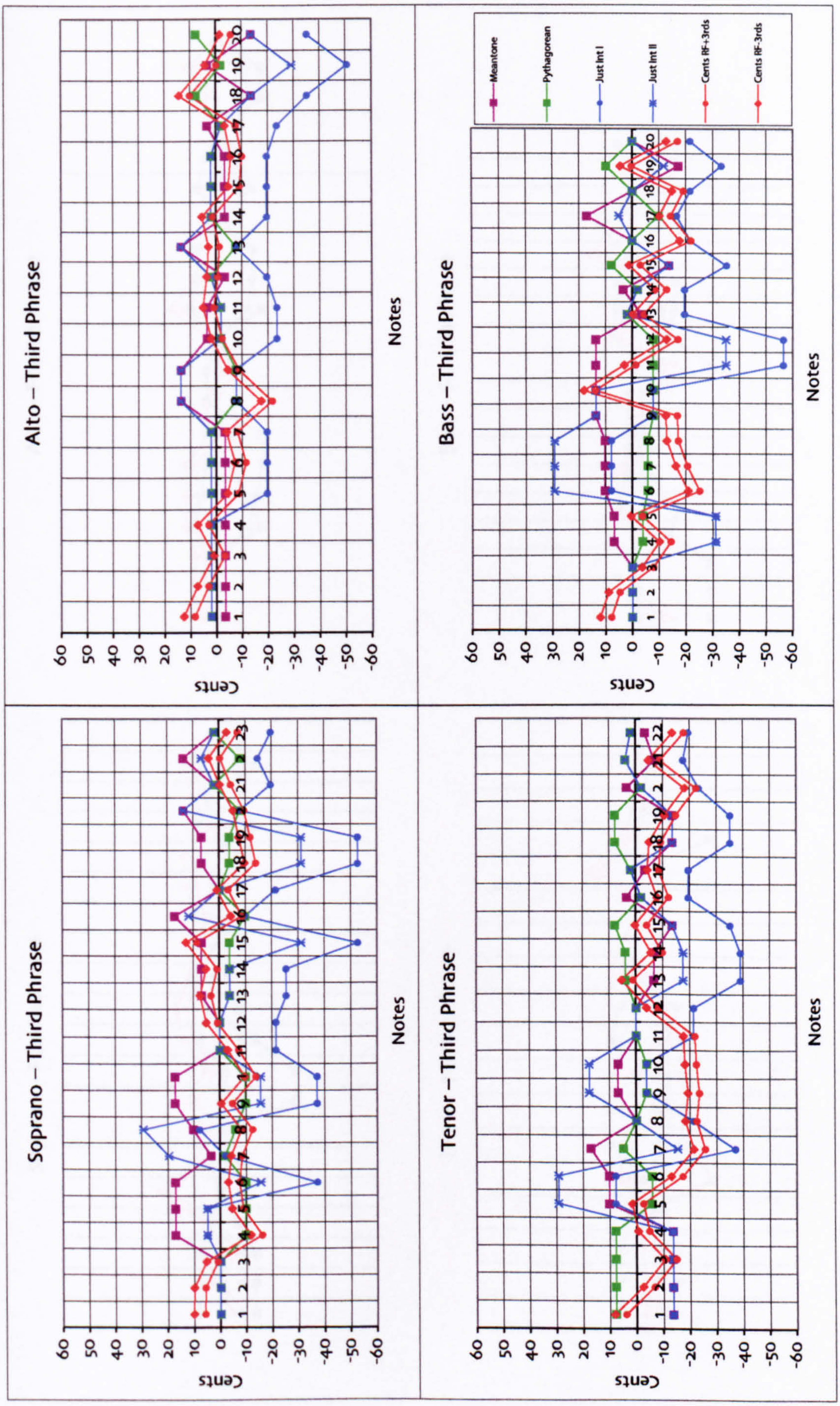
11.1A – BBC SECTIONS' CHARTS – PHRASE 1

11.1A – BBC SECTIONS' CHARTS – PHRASE 1



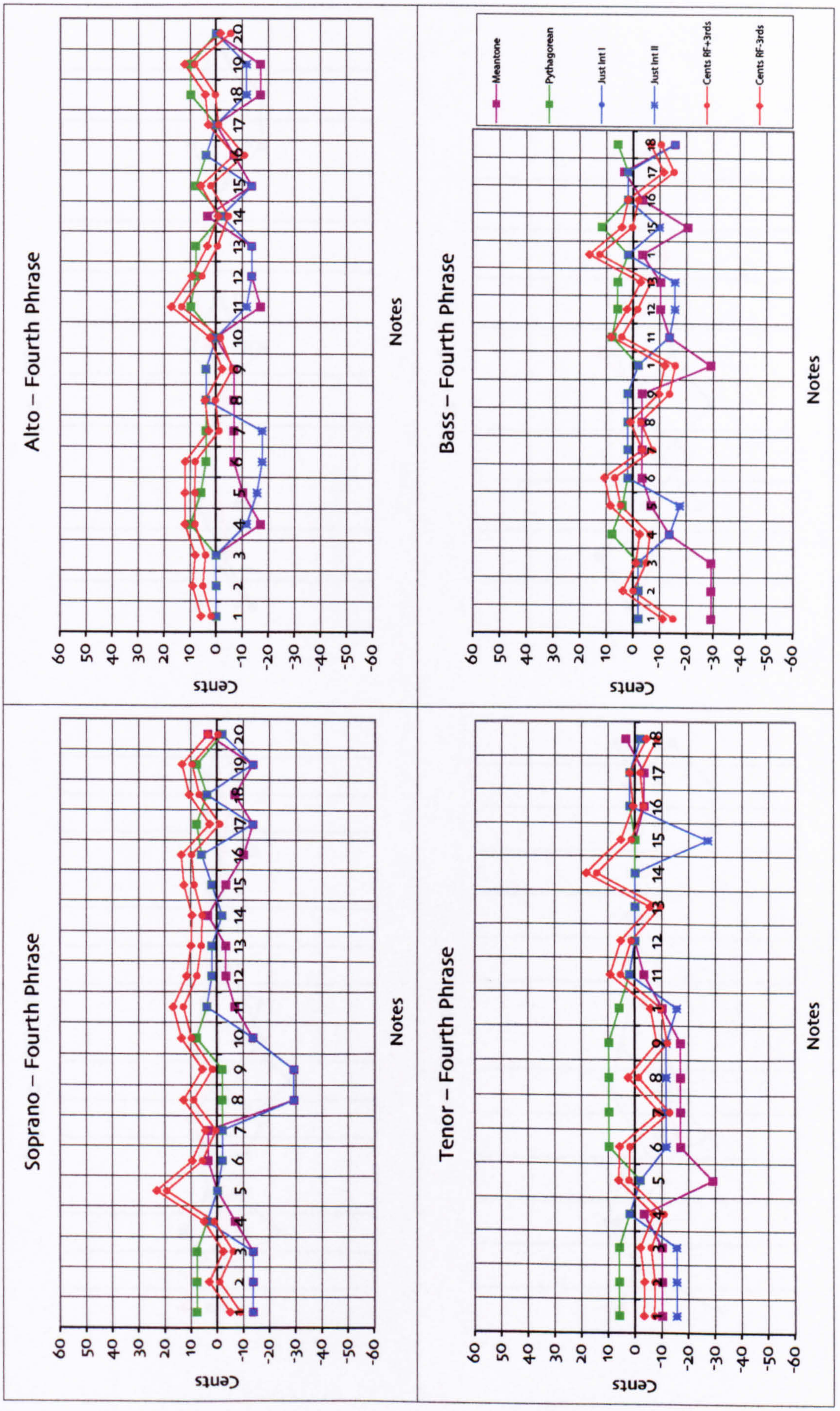
11.1B – BBC SECTIONS' CHARTS – PHRASE 2

11.1B – BBC SECTIONS' CHARTS – PHRASE 2



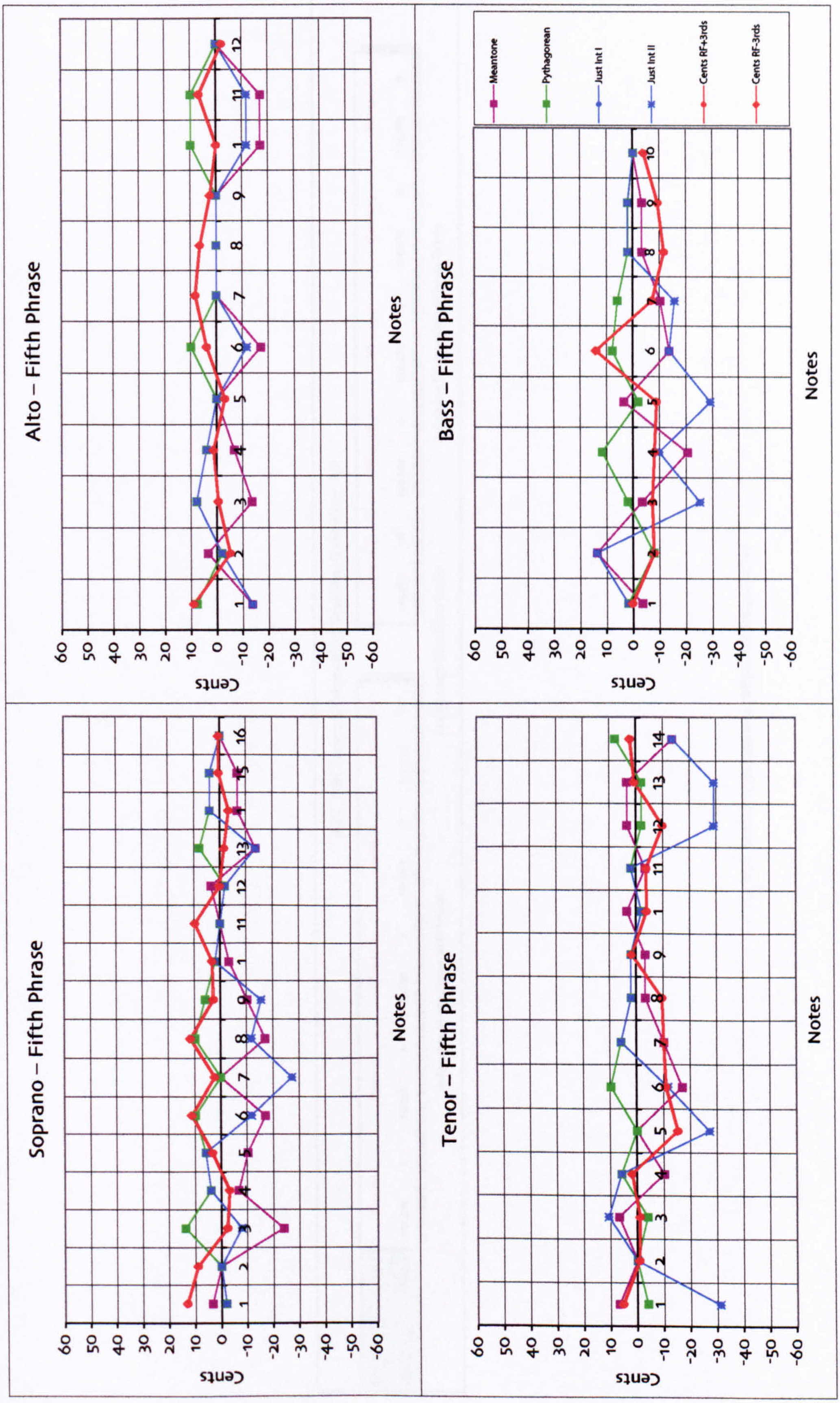
11.1c – BBC SECTIONS' CHARTS – PHRASE 3

11.1c – BBC sections' charts – Phrase 3



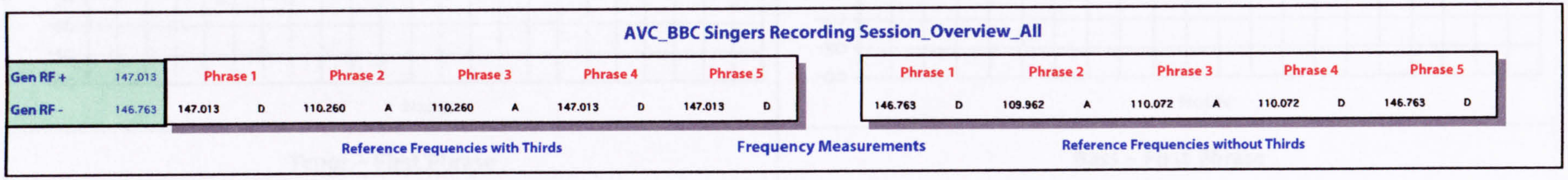
11.1D – BBC SECTIONS' CHARTS – PHRASE 4

11.1D – BBC SECTIONS' CHARTS – PHRASE 4



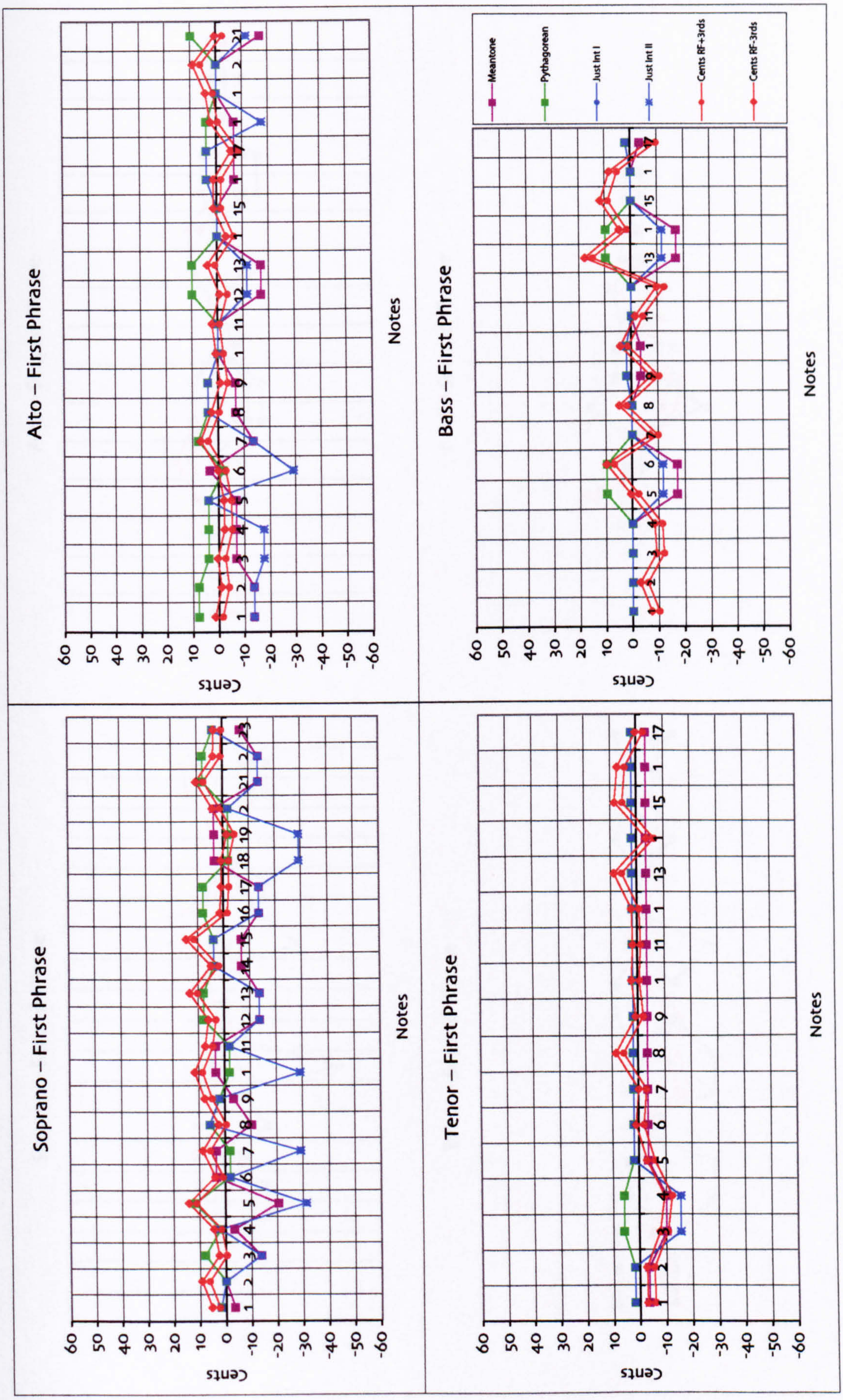
11.1E – BBC SECTIONS' CHARTS – PHRASE 5

11.1E – BBC SECTIONS' CHARTS – PHRASE 5



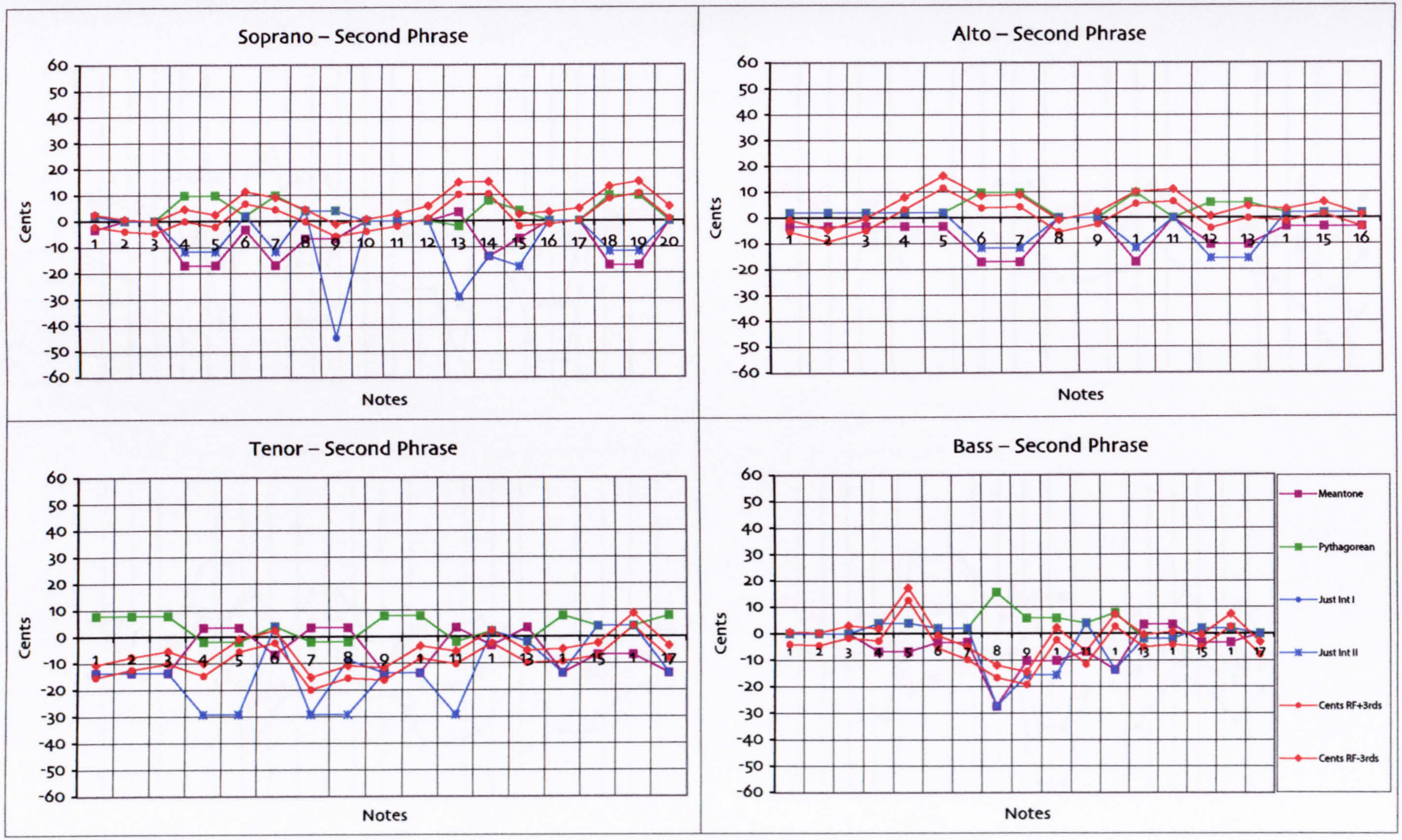
AVC_BBC Sections_Equalised reference frequencies

11.2 – THE BBC SINGERS SECTIONS' RESULTS (EQUALISED REFERENCE FREQUENCIES)

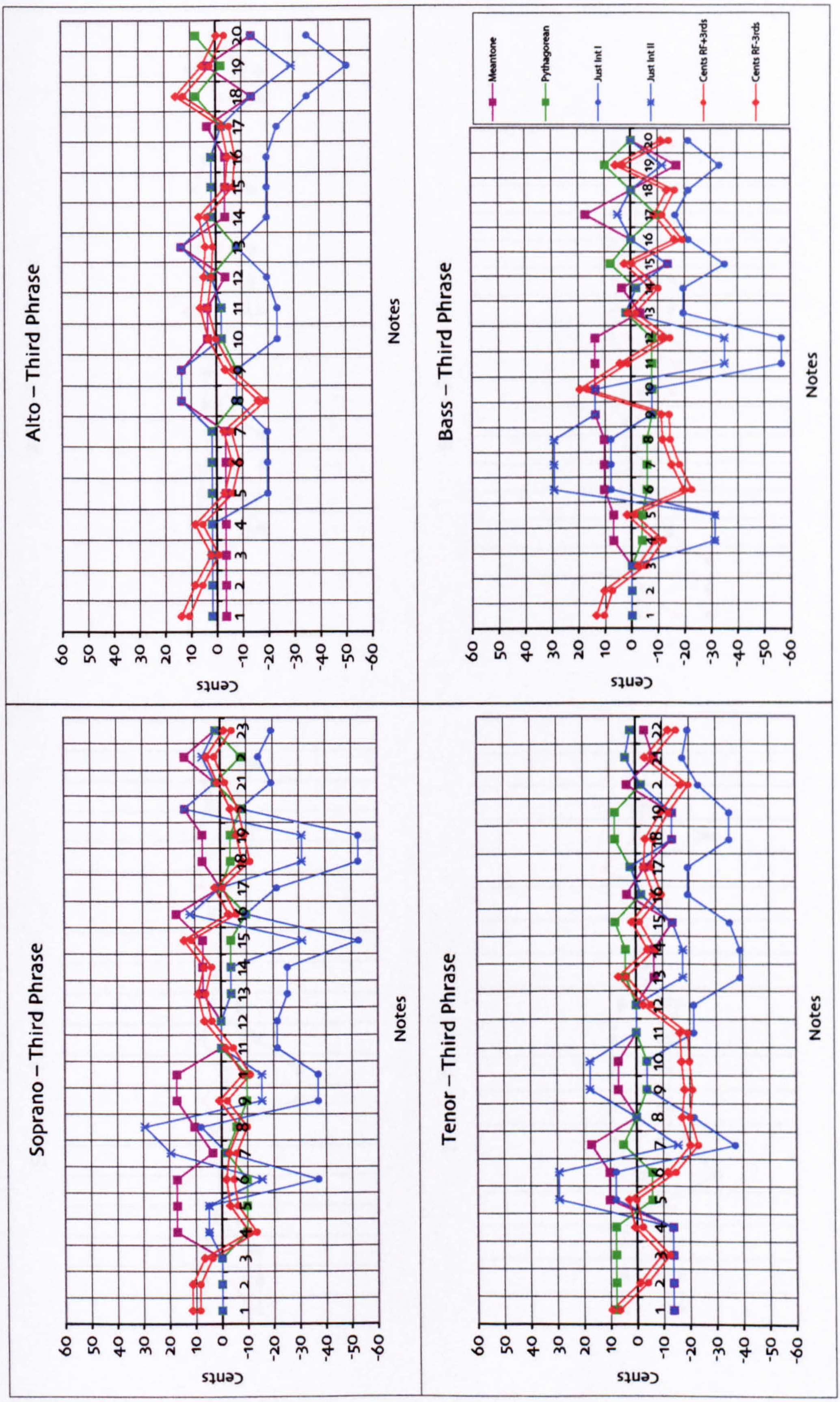


11.2A – BBC SECTIONS' CHARTS (EQUALISED) – PHRASE 1

11.2A – BBC SECTIONS' CHARTS (EQUALISED) – PHRASE 1

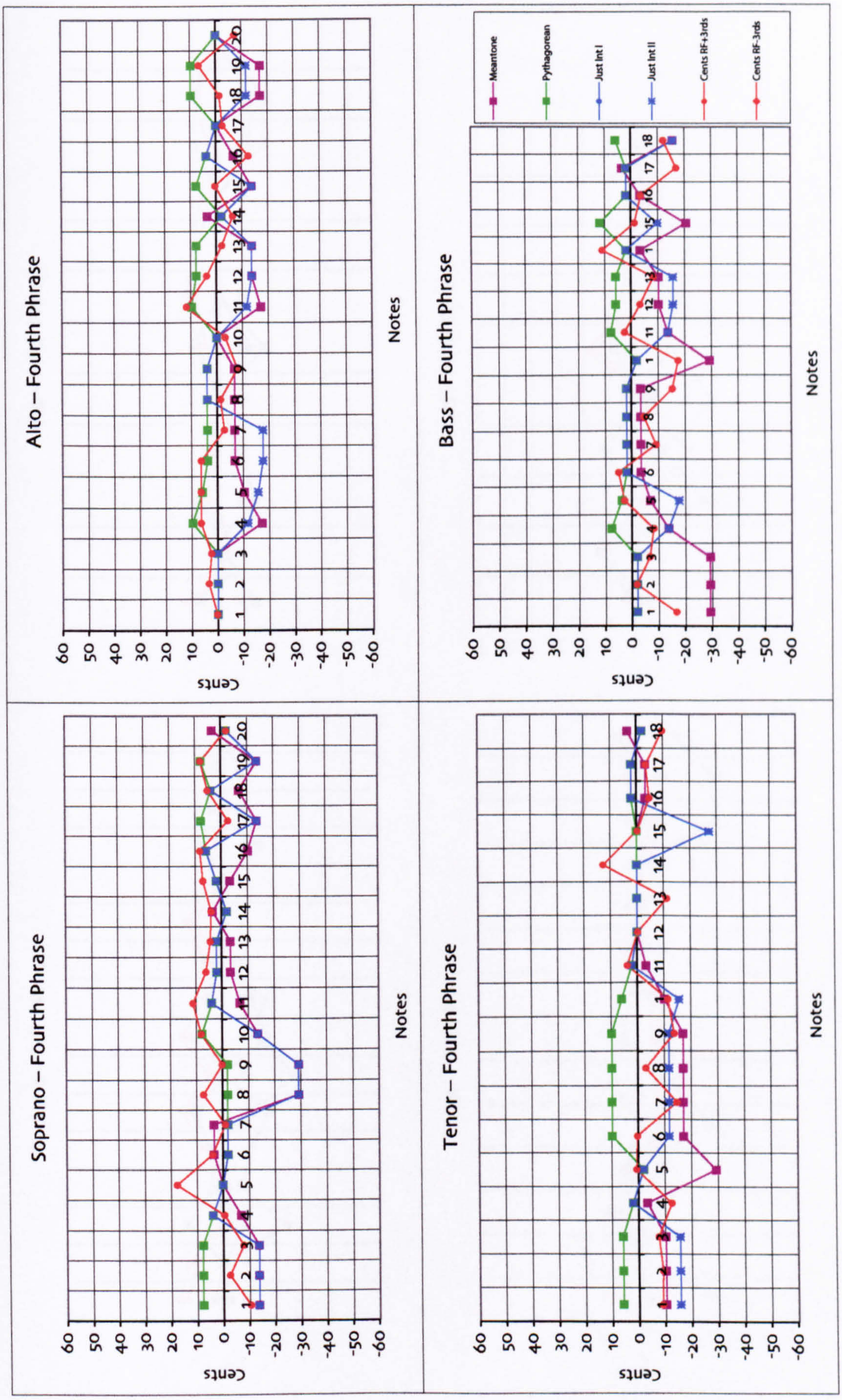

Soprano – Second Phrase
Alto – Second Phrase
Tenor – Second Phrase
Bass – Second Phrase
Cents
Notes
Meantone
Pythagorean
Just Int I
Just Int II
Cents RF+3rds
Cents RF-3rds

11.2B – BBC SECTIONS' CHARTS (EQUALISED) – PHRASE 2



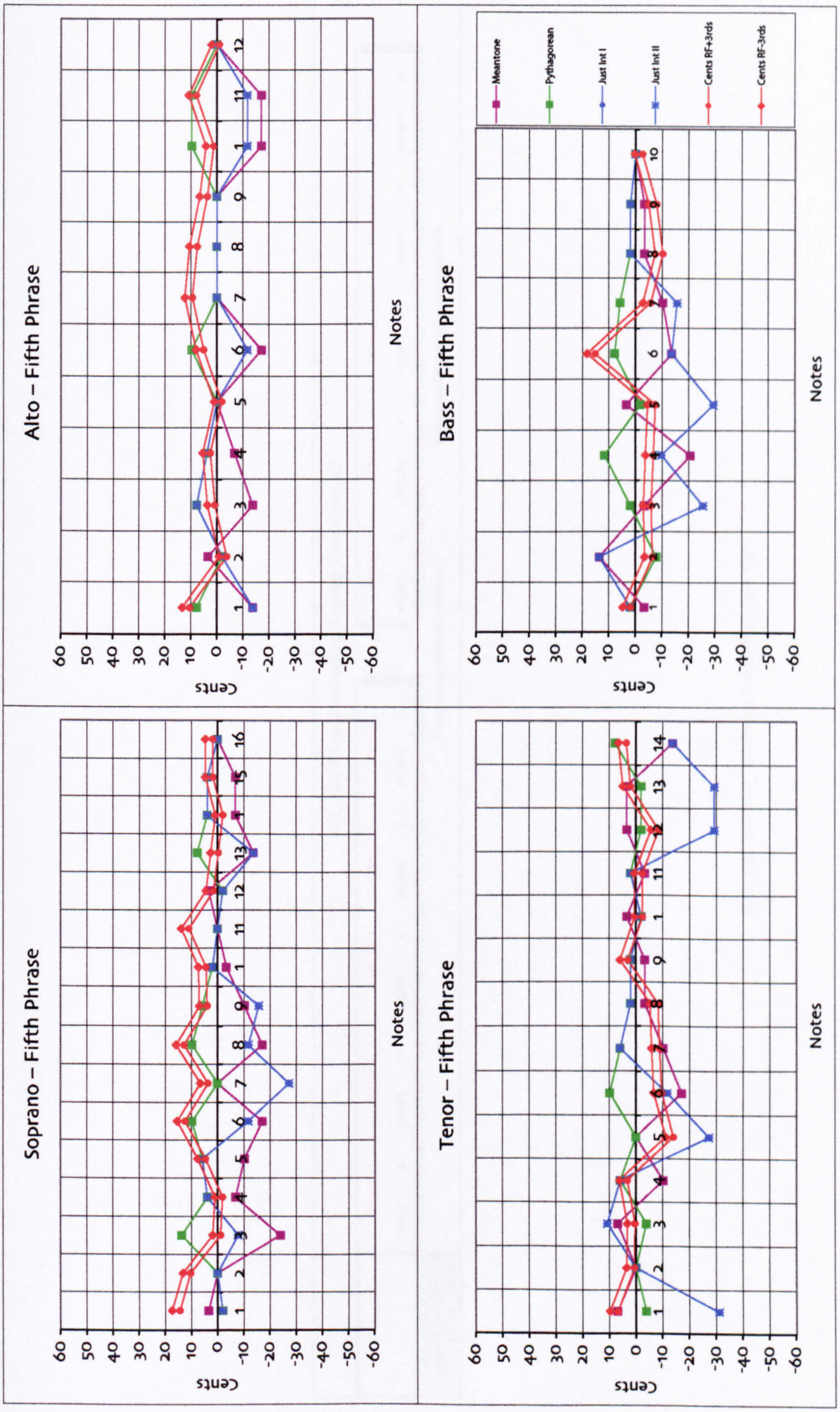
11.2c – BBC sections' charts (equalised) – Phrase 3

11.2C – BBC SECTIONS' CHARTS (EQUALISED) – PHRASE 3



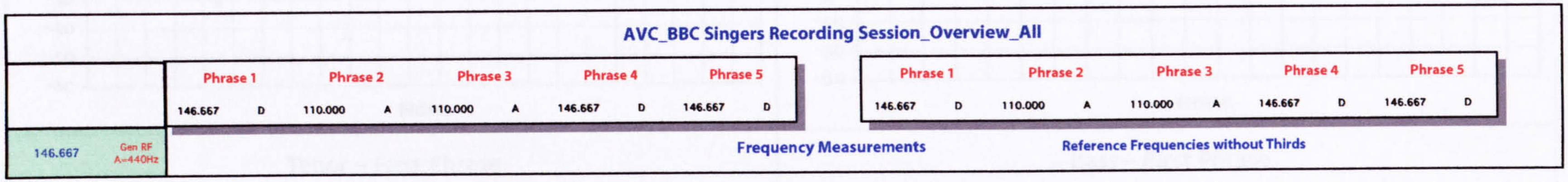
11.2D – BBC SECTIONS' CHARTS (EQUALISED) – PHRASE 4

11.2D – BBC SECTIONS' CHARTS (EQUALISED) – PHRASE 4



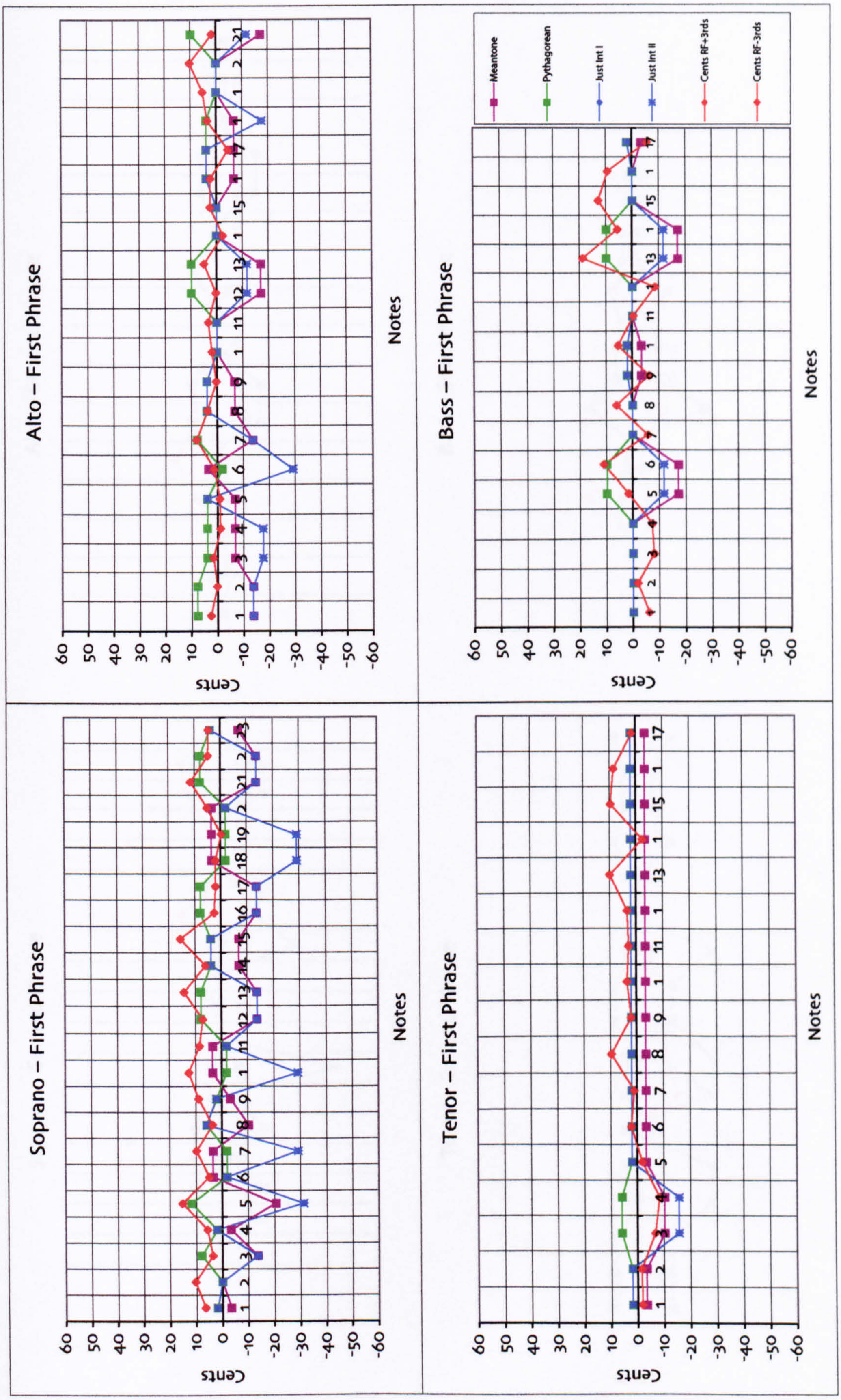
11.2E – BBC SECTIONS' CHARTS (EQUALISED) – PHRASE 5

11.2E – BBC SECTIONS' CHARTS (EQUALISED) – PHRASE 5



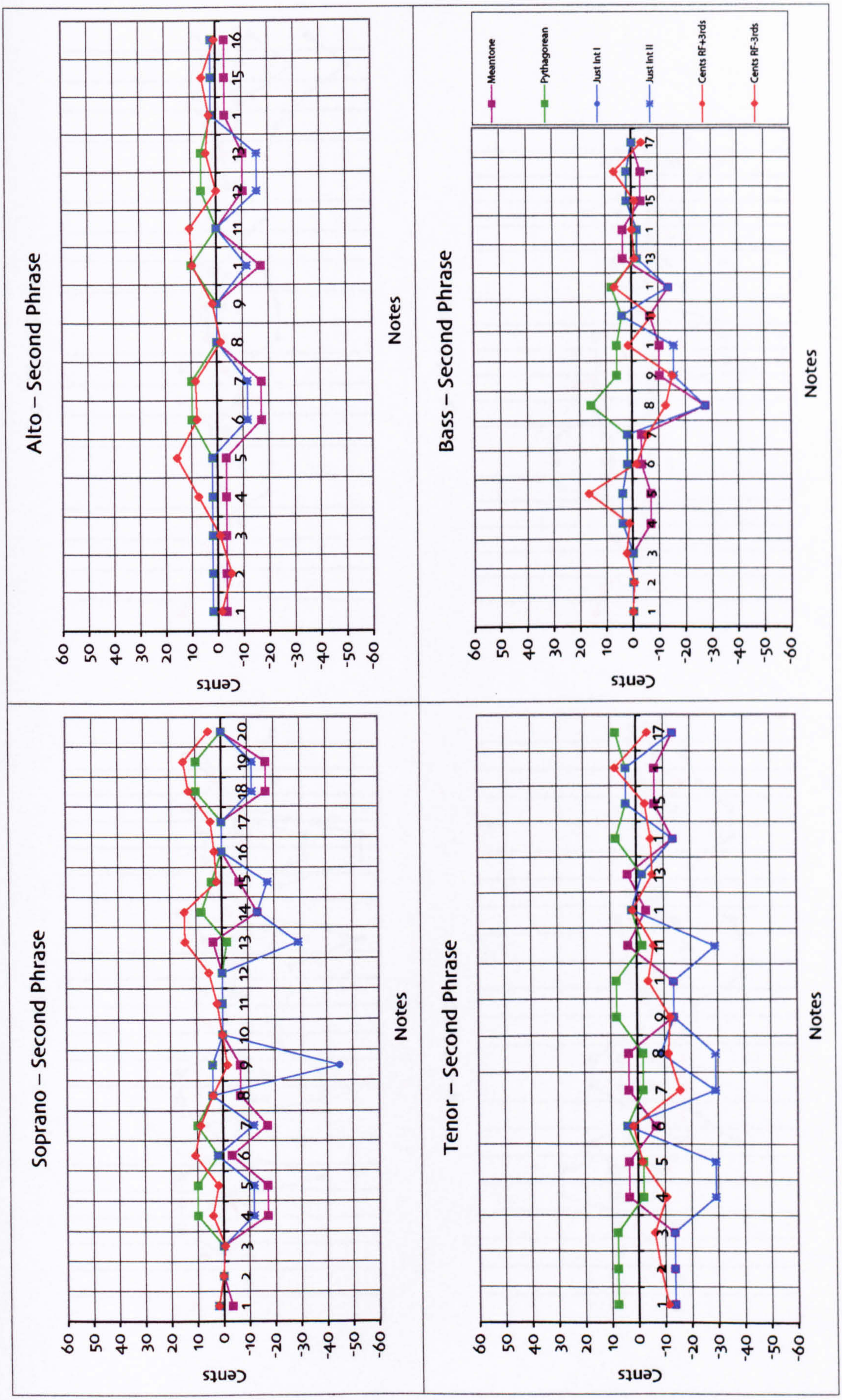
AVC_BBC Sections_Reference frequency=440 Hz

11.3 - THE BBC SINGERS SECTIONS' RESULTS (REFERENCE FREQUENCY = 440HZ)



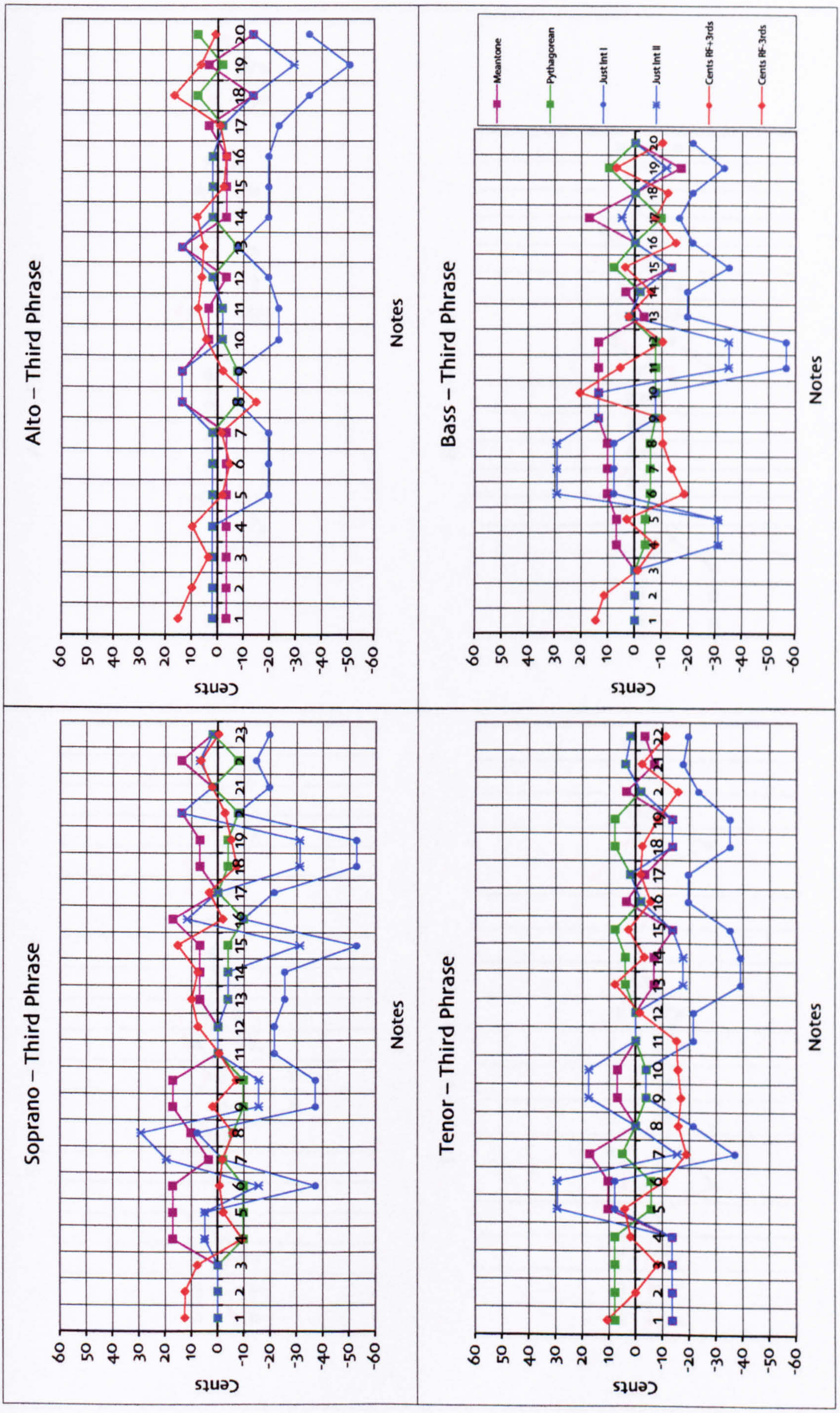
11.3A – THE BBC SINGERS SECTIONS' CHARTS (440HZ) – PHRASE 1

11.3A – THE BBC SINGERS SECTIONS' CHARTS (440HZ) – PHRASE 1



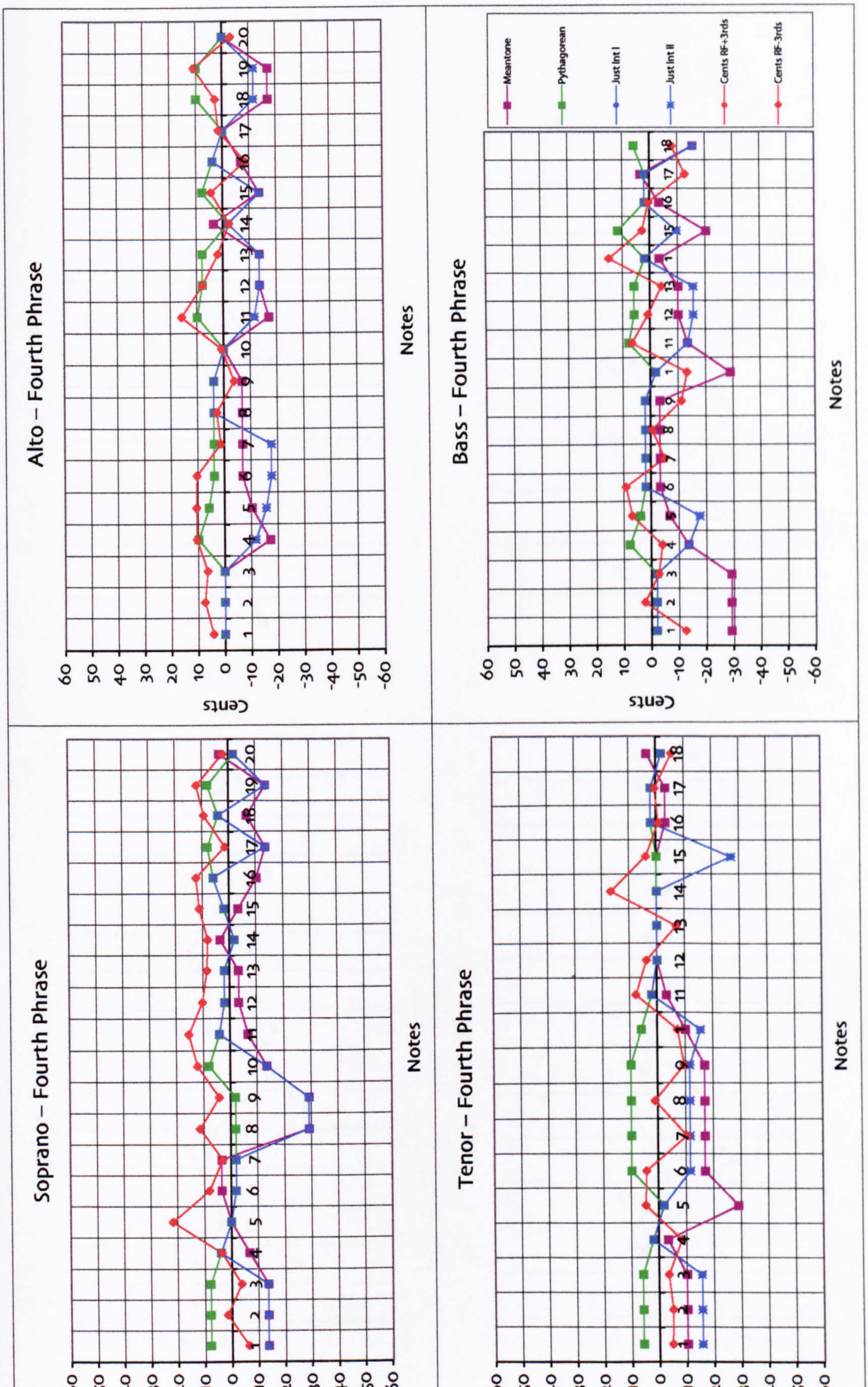
11.3B – THE BBC SINGERS SECTIONS' CHARTS (440HZ) – PHRASE 2

11.3B – THE BBC SINGERS SECTIONS' CHARTS (440HZ) – PHRASE 2



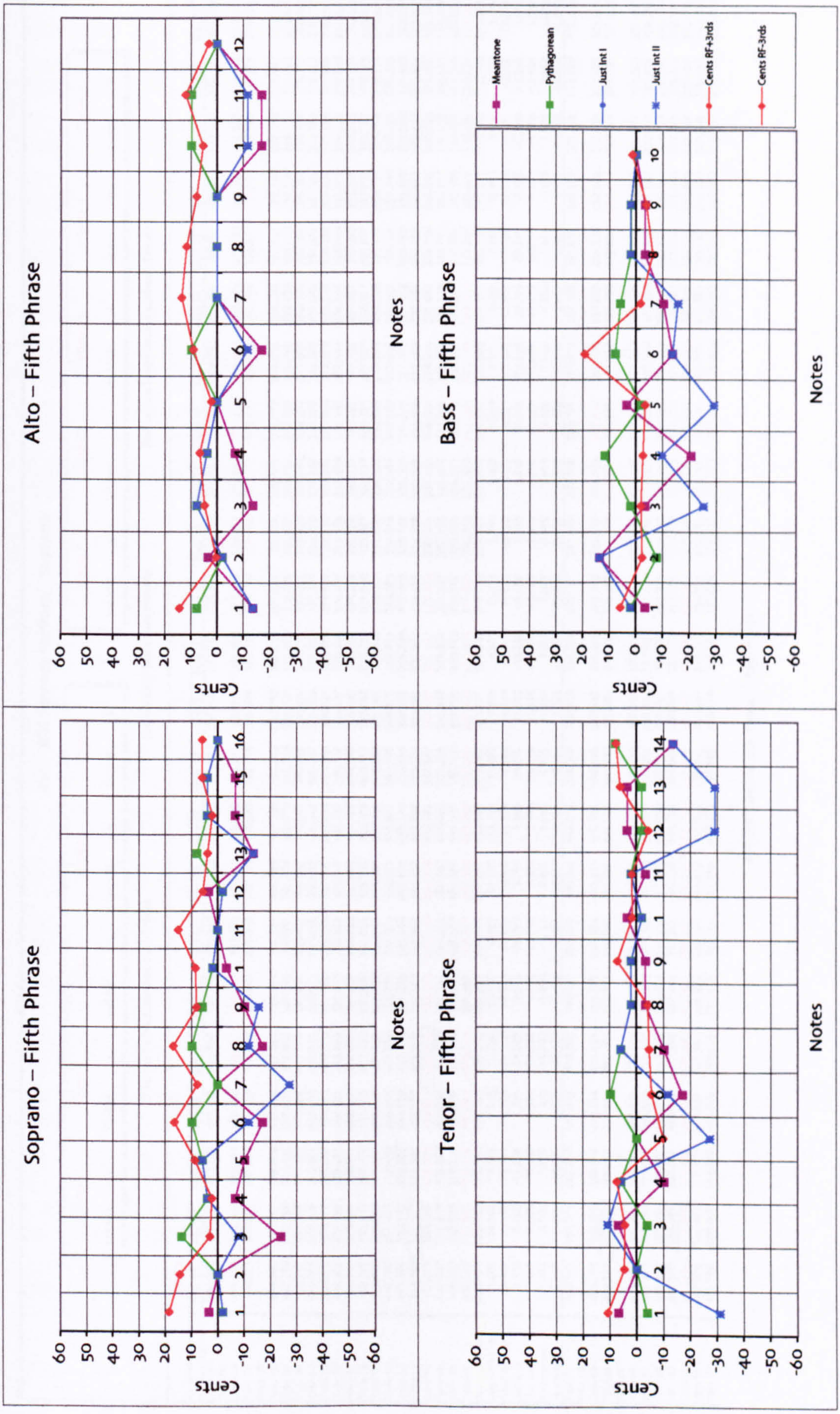
11.3c – The BBC Singers sections' charts (440Hz) – Phrase 3

11.3c – The BBC Singers sections' charts (440Hz) – Phrase 3



11.3D – THE BBC SINGERS SECTIONS' CHARTS (440HZ) – PHRASE 4

11.3D – THE BBC SINGERS SECTIONS' CHARTS (440HZ) – PHRASE 4



11.3E – THE BBC SINGERS SECTIONS' CHARTS (440HZ) – PHRASE 5

11.3E – THE BBC SINGERS SECTIONS' CHARTS (440HZ) – PHRASE 5

AVC _ BBC Singers Sections _ Soprano

Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
147.030	D	110.057	A	110.428	A	146.875	D	147.179	D

Reference Frequencies with Thirds

Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
146.658	D	109.949	A	110.156	A	146.543	D	147.138	D

Reference Frequencies without Thirds

Frequency Measurements

First Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
Take 01	449.368	588.558	378.037	441.495	420.997	397.280	399.533	490.706	443.013	396.256	393.423	373.781	376.323	333.272	326.997	372.943	373.592	395.730	396.201	397.848	377.952	372.119	331.380
Take 02																							
Take 03	444.073	591.468	372.317	440.796	420.462	398.235	392.590	494.348	434.583	398.741	392.873	370.872	377.004	329.387	329.697	375.415	375.585	393.424	398.530	393.603	372.581	370.537	334.856
Take 04	446.324	591.921	381.268	445.564	422.364	395.362	391.947	490.519	438.681	398.774	395.018	375.753	379.793	334.408	323.472	373.973	374.767	395.858	396.315	398.584	372.166	371.676	331.585
Take 05																							
Take 06	444.365	585.942	368.608	437.636	417.085	395.374	396.221	496.664	439.095	393.200	393.792	367.331	371.825	330.466	335.106	372.414	374.412	399.249	398.287	397.139	372.578	371.487	332.369
Take 07	442.757	601.738	374.681	443.237	418.608	397.194	397.087	503.334	443.638	397.330	392.729	372.429	375.226	332.552	333.861	372.995	367.448	393.734	389.780	393.539	369.157	375.964	334.301
Take 08	446.212	592.580	379.879	442.881	421.375	393.856	393.992	496.867	445.031	390.369	399.617	372.971	377.411	331.900	331.042	372.882	371.849	393.105	396.071	396.505	370.407	374.761	332.960
Take 09	456.955	599.430	375.521	447.602	428.271	399.055	395.816	503.953	445.966	397.114	397.535	374.327	377.285	330.410	335.142	375.923	372.507	397.043	394.873	397.395	372.099	372.419	330.797
Take 10	443.032	591.918	363.687	436.235	416.279	391.506	392.246	487.199	444.829	397.246	388.537	368.997	376.689	327.630	329.022	373.840	372.370	396.243	388.104	394.557	371.180	371.849	330.233
Take 11	446.926	600.169	369.861	440.935	419.223	395.695	399.857	506.803	442.787	399.727	396.197	370.563	374.177	333.156	332.449	372.152	371.614	396.065	398.043	399.913	376.328	375.633	334.621
Take 12	445.622	594.844	368.931	442.857	422.228	394.018	396.234	497.285	446.852	394.495	398.530	372.287	374.293	330.576	335.333	372.603	374.192	394.483	399.968	394.928	373.273	374.774	330.625
Take 13	448.808	595.946	381.876	444.225	423.782	397.208	391.543	499.861	442.413	400.422	398.664	372.737	381.948	333.567	332.137	370.981	371.094	396.617	390.897	394.835	373.197	372.084	330.849
Take 14	443.449	587.675	375.464	441.227	421.482	397.068	396.305	499.480	447.727	400.809	397.006	372.044	375.457	331.700	334.091	370.963	373.274	394.178	395.474	395.177	375.774	376.114	331.826
Take 15	447.057	591.454	368.430	440.956	421.517	395.733	397.020	502.071	446.627	394.905	398.175	369.811	374.080	330.816	332.857	368.120	373.648	392.061	391.104	393.545	372.439	370.385	332.733
Take 16	441.591	598.173	373.063	443.360	417.286	391.296	390.646	492.656	448.145	393.445	392.792	369.848	372.963	329.762	336.390	364.265	371.537	394.078	389.598	395.940	371.868	371.480	328.592
Take 17	444.093	573.432	375.007	439.178	418.840	391.543	390.950	498.357	443.853	393.306	392.923	370.277	374.536	329.888	330.323	368.689	367.407	392.259	390.250	394.011	373.614	371.654	328.867
Take 18	443.058	592.679	376.269	444.921	432.845	396.904	395.729	493.418	442.322	397.547	389.502	371.737	377.814	330.074	331.183	369.902	374.395	391.642	395.166	393.247	369.785	374.969	326.546
Take 19	440.597	551.319	373.668	432.993	412.149	394.141	391.913	507.307	448.692	392.552	393.949	371.664	377.307	332.756	326.614	371.390	366.770	391.779	388.641	395.855	371.559	369.515	331.096
Take 20	446.190	593.631	370.794	434.686	418.456	388.907	397.567	501.697	440.081	390.370	391.703	369.675	374.140	329.646	336.671	368.441	368.344	389.201	387.291	397.466	368.537	369.314	328.522
Take 21	443.524	595.652	370.539	441.788	418.724	391.493	389.229	497.412	443.068	394.868	397.687	372.331	377.051	330.215	331.979	371.509	373.174	395.844	387.786	391.875	370.118	369.723	329.881
Sop 1 AVERAGE	445.474	593.633	373.574	441.188	420.630	394.835	394.549	497.891	443.548	395.867	394.771	371.549	376.070	331.167	331.809	371.547	371.999	394.347	393.283	395.577	372.348	372.445	331.191
Cents RF+3rds	19.081	16.158	14.345	2.345	19.735	10.173	8.917	11.670	11.579	14.693	9.893	4.937	25.872	5.746	9.095	4.928	7.031	8.031	3.355	13.423	8.654	9.106	5.871
Cents RF-3rds	23.457	20.535	18.721	6.721	24.112	14.549	13.293	16.046	15.956	19.069	14.269	9.313	30.249	10.122	13.471	9.304	11.407	12.407	7.731	17.799	13.031	13.482	10.248
Just Int I	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Just Int II	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Pythagorean	1.955	0.000	7.820	1.955	11.730	-1.955	-1.955	5.865	1.955	-1.955	-1.955	7.820	7.820	3.910	3.910	7.820	7.820	-1.955	-1.955	-1.955	7.820	7.820	3.910
Meantone	-3.421	0.000	-13.686	-3.421	-20.530	3.422	3.422	-10.264	-3.421	3.422	3.422	-13.686	-13.686	-6.843	-6.843	-13.686	-13.686	3.422	3.422	3.422	-13.686	-13.686	-6.843
Take 01	446.801	604.674	361.290	441.845	418.485	394.055	395.278	496.505	445.616	398.565	397.519	369.012	370.467	331.489	337.968	370.791	370.915	387.480	391.647	393.929	375.122	373.709	332.458
Take 02																							
Take 03	438.535	595.570	366.754	440.834	415.983	391.283	388.496	492.675	440.382	392.238	392.887	371.208	373.983	329.517	333.586	367.637	368.436	388.260	385.804	390.100	375.154	371.495	331.523
Take 04	439.211	562.160	369.018	444.934	418.406	393.811	392.708	495.797	444.157	393.370	395.389	371.512	376.207	338.778	332.974	373.981	371.537	392.706	392.896	395.347	370.719	374.156	331.375
Take 05																							
Take 06	443.187	589.881	368.011	442.361	420.000	394.975	395.551	497.997	444.801	396.480	396.239	373.794	377.856	331.141	331.367	370.270	370.357	396.799	392.581	394.552	374.374	373.604	331.781
Take 07	447.419	593.069	377.070	440.854	413.800	392.970	395.269	495.204	444.977	397.262	394.524	372.373	376.608	329.069	334.487	369.206	365.596	393.958	392.898	393.807	372.910	369.910	332.186
Take 08	445.617	594.647	370.447	437.558	417.241	393.850	392.666	492.890	442.760	393.812	395.507	372.760	371.371	329.763	342.703	373.562	368.485	392.346	393.311	393.218	374.336	372.386	332.360
Take 09	451.332	586.882	362.963	442.679	421.888	397.446	395.882	480.982	448.336	399.698	392.797	371.664	376.457	333.636	335.106	374.205	371.419	396.423	393.268	395.346	377.211	375.239	330.701
Take 10	440.844	578.060	363.262	444.267	415.065	392.481	391.066	488.162	439.015	393.410	393.653	372.980	369.427	330.625	333.397	368.764	369.215	388.925	388.016	390.625	369.788	366.567	332.906
Take 11	443.975	596.445	376.476	442.281	415.985	392.873	397.390	497.859	447.514	399.803	398.341	374.341	383.970	330.461	334.461	372.781	365.894	391.951	393.186	395.729	378.256	378.212	334.388
Take 12	443.760	600.481	363.570	445.723	419.576	395.689	400.164	492.914	447.830	394.956	403.609	369.769	372.608	329.682	333.535	372.034	367.644	394.648	390.246	392.553	375.793	370.485	332.419

Take 13	440.725	602.093	369.978	443.369	416.526	393.779	394.514	505.250	447.916	397.194	398.203	372.152	374.036	331.580	334.859	371.925	369.560	389.304	390.834	395.107	377.215	369.047	329.472
Take 14	447.924	599.810	372.059	442.009	419.929	398.071	401.179	494.240	447.670	403.090	402.816	376.497	374.169	332.405	332.126	370.073	369.360	393.710	391.235	393.628	371.206	369.248	335.023
Take 15	440.424	597.116	370.900	439.665	415.202	392.514	394.522	499.671	441.794	394.028	391.799	370.509	373.790	330.067	331.418	365.078	364.532	389.425	394.328	393.159	374.277	366.736	329.477
Take 16	439.515	591.652	369.019	433.655	408.579	387.867	389.861	485.980	439.580	394.857	394.209	368.985	367.053	326.619	327.776	365.107	365.528	388.647	382.320	388.897	371.117	366.195	329.997
Take 17	439.717	518.882	370.811	437.866	412.214	393.025	394.424	488.803	441.937	389.564	391.695	368.517	369.520	329.306	334.299	367.938	364.671	389.925	388.220	392.039	372.228	368.069	328.972
Take 18	439.923	590.449	373.643	436.731	415.851	396.781	396.135	504.833	446.036	400.283	396.763	372.683	375.747	329.540	327.348	365.953	366.854	393.318	393.421	391.355	372.009	372.861	330.437
Take 19	438.422	597.270	368.105	437.209	410.527	387.455	390.666	490.437	440.841	389.969	392.411	369.818	373.445	326.090	333.828	365.395	368.708	389.812	390.879	389.777	371.947	370.111	327.074
Take 20	438.609	591.426	370.460	437.155	410.233	388.245	389.374	497.401	440.951	393.215	393.364	365.499	371.072	325.530	330.675	366.526	366.052	389.604	389.182	392.229	371.065	373.554	327.058
Take 21	442.023	601.306	367.855	441.042	416.550	393.052	391.966	495.259	444.258	394.948	396.055	372.045	370.932	327.216	333.520	372.086	368.755	390.820	390.250	390.498	372.731	371.933	330.976
Sop 2 AVERAGE	**442.524**	**595.798**	**369.036**	**440.633**	**415.897**	**393.170**	**394.058**	**494.361**	**444.019**	**395.618**	**395.673**	**371.375**	**373.617**	**330.132**	**333.444**	**369.648**	**368.080**	**391.477**	**390.764**	**392.731**	**373.551**	**371.238**	**331.083**
Cents RF+3rds	7.581	22.461	-6.811	0.168	0.143	2.855	6.764	-0.649	13.420	13.603	13.842	4.123	14.544	0.325	17.605	-3.945	-11.304	-4.615	-7.769	0.924	14.237	3.485	5.306
Cents RF-3rds	11.957	26.837	-2.435	4.544	4.519	7.231	11.140	3.727	17.796	17.979	18.218	8.499	18.920	4.702	21.981	0.431	-6.928	-0.239	-3.393	5.300	18.613	7.861	9.682
Just Int I	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Just Int II	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Pythagorean	1.955	0.000	7.820	1.955	11.730	-1.955	-1.955	5.865	1.955	-1.955	-1.955	7.820	7.820	3.910	3.910	7.820	7.820	-1.955	-1.955	-1.955	7.820	7.820	3.910
Meantone	-3.421	0.000	-13.686	-3.421	-20.530	3.422	3.422	-10.264	-3.421	3.422	3.422	-13.686	-13.686	-6.843	-6.843	-13.686	-13.686	3.422	3.422	3.422	-13.686	-13.686	-6.843
Take 01	437.628	584.249	362.869	439.917	423.169	388.787	392.224	488.529	442.038	393.926	387.926	373.150	366.936	328.494	331.311	367.433	372.814	392.643	390.958	392.188	375.083	375.187	327.678
Take 02																							
Take 03	433.770	592.957	367.769	445.912	425.637	389.649	388.534	493.148	433.544	390.920	388.818	370.042	370.955	329.467	326.821	366.120	367.573	391.451	396.551	392.478	377.011	368.897	329.142
Take 04	441.381	591.752	368.861	452.536	419.714	383.571	395.001	503.479	442.367	398.623	391.470	366.286	375.038	333.157	331.452	371.554	369.263	391.879	395.417	395.051	373.261	368.323	329.531
Take 05																							
Take 06	433.916	587.356	371.121	447.775	419.958	390.652	386.341	503.467	446.438	388.427	393.321	367.292	373.797	334.342	328.881	370.491	370.326	392.029	392.159	392.700	372.446	369.529	328.564
Take 07	439.712	589.702	374.013	441.850	418.955	387.563	397.244	497.042	441.282	396.522	395.988	373.196	369.025	331.646	332.909	366.438	367.500	389.705	392.762	392.361	371.155	370.750	329.909
Take 08	431.296	588.539	350.253	444.202	412.911	388.806	397.609	489.314	433.316	396.409	391.925	371.733	370.052	329.225	337.116	367.831	376.737	393.499	390.785	392.901	372.458	369.646	330.166
Take 09	444.259	595.589	360.836	433.070	422.675	392.330	394.348	490.342	437.644	398.312	392.392	374.064	370.447	329.412	337.307	375.783	374.629	392.352	391.481	393.770	369.113	375.475	329.295
Take 10	444.517	575.614	367.834	435.659	412.809	389.318	383.782	482.360	434.870	393.112	391.603	370.944	370.641	330.834	329.319	370.921	372.220	391.183	392.633	390.871	367.412	371.577	327.825
Take 11	437.287	586.499	369.340	441.447	418.226	387.333	392.222	493.795	439.293	392.679	391.748	367.584	368.299	331.639	331.652	365.006	372.854	391.053	394.108	394.656	369.259	371.905	328.866
Take 12	442.452	583.404	369.838	437.989	421.788	390.898	395.205	498.334	438.877	392.279	394.566	366.556	370.299	329.583	332.468	370.381	371.677	392.306	390.793	391.875	370.002	373.552	332.062
Take 13	431.027	587.586	372.540	436.282	416.038	389.555	392.905	488.183	434.144	392.923	392.868	372.129	370.007	332.466	327.342	372.315	371.136	394.185	390.511	393.396	369.319	369.117	329.266
Take 14	441.845	388.457	359.646	437.365	416.937	389.842	395.927	490.542	439.632	393.959	390.132	370.565	369.598	330.505	336.852	370.746	369.410	392.694	391.152	388.116	366.711	363.133	328.602
Take 15	434.630	585.011	366.634	437.907	416.683	383.917	388.662	493.582	436.343	395.393	393.395	361.342	370.388	330.497	333.322	369.953	371.354	394.591	390.377	392.166	374.087	373.123	328.713
Take 16	436.654	591.082	373.281	451.277	418.483	388.127	387.367	491.822	441.653	391.156	392.260	369.908	372.469	328.978	333.545	370.492	369.438	394.118	387.100	392.380	367.297	367.246	326.217
Take 17	429.223	583.849	366.379	432.122	411.509	387.538	392.165	488.749	434.067	389.893	390.663	365.147	368.170	327.052	331.371	370.783	368.963	390.568	388.818	391.961	369.195	365.030	325.357
Take 18	438.822	585.785	370.930	442.663	417.474	386.933	388.012	495.689	435.132	394.951	389.991	367.609	361.676	328.037	328.046	371.825	366.893	386.373	391.047	387.632	366.981	371.020	328.655
Take 19	438.632	570.882	369.258	438.089	415.049	389.423	396.716	501.327	440.430	394.217	391.376	375.519	367.234	331.962	331.272	371.802	371.677	390.756	388.587	391.339	369.051	365.683	325.815
Take 20	437.265	569.102	373.661	434.468	413.080	388.817	390.265	495.899	439.500	393.959	393.254	367.307	369.234	328.174	330.618	371.587	368.093	389.738	389.654	390.868	378.916	370.570	327.555
Take 21	435.063	588.833	368.772	436.870	421.477	390.913	393.299	493.135	440.120	396.865	392.995	373.729	370.771	329.294	331.377	364.804	366.664	387.102	385.629	389.892	370.091	366.893	327.591
Sop 3 AVERAGE	**437.671**	**586.394**	**368.532**	**440.390**	**418.030**	**388.630**	**391.991**	**493.618**	**438.457**	**393.922**	**391.931**	**369.690**	**369.739**	**330.251**	**331.736**	**369.803**	**370.485**	**391.486**	**391.080**	**391.926**	**370.992**	**369.824**	**328.464**
Cents RF+3rds	-11.510	-5.084	-9.178	-0.791	9.001	-17.250	-2.343	-3.254	-8.403	6.166	-2.607	-3.750	-3.520	0.947	8.715	-3.217	-0.028	-4.576	-6.370	-2.628	2.339	-3.120	-8.446
Cents RF-3rds	-7.134	-0.708	-4.802	3.585	13.377	-12.874	2.033	1.123	-4.027	10.542	1.769	0.626	0.856	5.323	13.091	1.159	4.348	-0.200	-1.994	1.748	6.715	1.256	-4.070
Just Int I	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Just Int II	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Pythagorean	1.955	0.000	7.820	1.955	11.730	-1.955	-1.955	5.865	1.955	-1.955	-1.955	7.820	7.820	3.910	3.910	7.820	7.820	-1.955	-1.955	-1.955	7.820	7.820	3.910
Meantone	-3.421	0.000	-13.686	-3.421	-20.530	3.422	3.422	-10.264	-3.421	3.422	3.422	-13.686	-13.686	-6.843	-6.843	-13.686	-13.686	3.422	3.422	3.422	-13.686	-13.686	-6.843
Take 01	445.234	580.093	371.152	432.218	423.066	399.117	397.651	483.647	442.627	395.465	395.000	373.249	372.946	332.707	334.902	373.569	374.755	400.640	392.857	393.773	375.273	373.262	332.510
Take 02																							
Take 03	432.153	585.926	372.574	436.379	416.421	395.592	394.999	488.545	435.925	391.588	391.844	374.297	370.096	329.005	332.790	369.185	370.660	390.203	395.452	392.616	373.381	369.150	333.081
Take 04	440.810	584.407	374.248	444.850	421.208	395.877	402.177	494.245	447.455	395.647	394.002	374.145	372.689	334.352	336.361	372.333	370.005	391.628	392.410	390.951	376.770	370.139	329.958
Take 05																							
Take 06	432.434	577.245	368.597	463.722	420.989	397.203	403.747	489.499	438.622	391.035	391.401	374.876	369.751	329.980	330.948	367.291	373.405	391.911	390.381	393.379	372.485	369.275	328.715
Take 07	442.929	589.475	371.439	441.037	418.518	393.391	389.641	494.775	442.960	392.065	392.201	374.144	373.983	332.490	333.829	372.009	367.890	393.092	392.534	390.330	372.209	371.569	330.074
Take 08	439.338	584.128	369.701	441.352	422.598	392.042	396.613	493.458	442.998	392.394	392.967	375.875	373.042	326.892	331.522	368.836	369.919	394.046	392.729	391.543	373.836	371.780	330.801
Take 09	445.052	595.596	378.216	442.220	425.888	403.255	394.669	521.613	450.000	425.676	405.024	368.222	374.841	331.177	328.659	366.279	369.231	391.224	391.662	390.651	368.363	366.192	335.648
Take 10	436.299	561.193	366.197	440.062	413.634	391.523	393.983	488.063	436.960	387.174	385.736	368.348	370.796	328.117	330.424	367.943	369.268	385.276	388.929	388.261	371.855	365.217	329.702

Take 11	437.942	590.248	370.544	441.578	422.053	393.690	391.973	500.476	443.972	395.279	387.538	379.436	372.005	329.470	331.538	369.636	370.875	389.441	394.829	394.825	372.804	369.967	331.717
Take 12	435.861	588.188	373.202	441.286	419.613	393.159	396.725	493.495	443.972	395.107	393.497	373.689	370.017	331.302	334.811	372.781	370.793	392.249	393.330	391.259	372.098	370.565	330.301
Take 13	439.218	592.222	367.658	440.069	421.544	393.926	399.510	495.769	439.956	393.079	391.540	371.034	372.250	332.429	332.857	369.357	371.121	390.656	392.271	392.412	373.107	371.022	330.025
Take 14	455.673	574.000	373.808	445.080	421.721	391.676	396.132	504.412	445.638	397.080	392.940	372.676	373.910	330.223	334.886	367.238	367.257	386.143	389.286	390.322	367.459	367.127	328.239
Take 15	438.965	574.636	360.736	443.216	420.555	392.778	390.658	493.454	439.069	389.704	394.681	372.277	366.215	329.408	331.981	369.090	364.899	390.928	388.370	389.244	369.110	367.926	327.510
Take 16	437.586	587.573	368.551	436.770	418.166	393.896	390.990	486.603	436.661	389.341	389.441	368.196	368.620	327.723	326.819	364.847	371.380	388.292	385.752	387.942	369.969	368.082	327.406
Take 17	435.329	582.196	367.598	442.007	418.664	391.713	390.046	493.585	438.344	389.704	388.690	371.453	367.687	326.064	327.489	369.263	366.315	388.141	386.531	387.649	370.179	367.295	329.045
Take 18	436.347	560.822	366.092	441.000	417.873	390.874	390.061	495.353	442.822	388.453	389.200	368.114	372.509	327.205	328.507	365.035	364.956	388.333	384.043	389.039	366.899	369.990	327.069
Take 19	436.555	582.995	367.589	445.396	414.119	390.658	395.787	490.038	437.381	388.531	389.638	368.060	369.484	332.924	330.358	367.347	363.717	389.258	389.557	387.691	367.738	364.781	325.730
Take 20	433.888	451.676	345.689	435.206	412.782	394.078	391.060	476.668	434.278	393.970	391.848	368.468	368.235	330.322	328.810	370.978	370.405	390.174	394.253	388.057	372.497	365.658	328.153
Take 21	438.863	589.818	377.029	435.496	419.600	392.386	388.530	484.844	440.135	395.516	395.894	368.722	372.918	362.466	338.935	376.787	370.834	389.764	389.565	392.113	367.719	369.586	329.291
Sop 4 AVERAGE	438.972	584.922	370.274	441.523	419.422	394.044	394.471	491.496	441.041	392.285	391.559	371.857	371.158	330.099	331.917	369.463	369.352	390.600	390.776	390.635	371.250	368.873	329.736
Cents RF+3rds	-6.371	-9.435	-1.016	3.661	14.755	6.700	8.577	-10.712	1.768	-1.044	-4.252	6.369	3.111	0.154	9.660	-4.809	-5.332	-8.497	-7.718	-8.344	3.542	-7.578	-1.756
Cents RF-3rds	-1.995	-5.059	3.361	8.037	19.132	11.077	12.953	-6.335	6.144	3.332	0.124	10.745	7.487	4.530	14.036	-0.433	-0.956	-4.121	-3.342	-3.968	7.918	-3.202	2.620
Just Int I	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Just Int II	1.955	0.000	-13.686	1.995	-31.282	-1.955	-29.219	5.865	1.995	-29.219	-1.955	-13.686	-13.686	3.910	3.910	-13.686	-13.686	-29.219	-29.219	-1.955	-13.686	-13.686	3.910
Pythagorean	1.955	0.000	7.820	1.955	11.730	-1.955	-1.955	5.865	1.955	-1.955	-1.955	7.820	7.820	3.910	3.910	7.820	7.820	-1.955	-1.955	-1.955	7.820	7.820	3.910
Meantone	-3.421	0.000	-13.686	-3.421	-20.530	3.422	3.422	-10.264	-3.421	3.422	3.422	-13.686	-13.686	-6.843	-6.843	-13.686	-13.686	3.422	3.422	3.422	-13.686	-13.686	-6.843

Second Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
Take 01	334.243	448.196	440.722	420.769	421.793	335.116	421.633	496.872	499.276	446.181	442.877	446.092	596.313	562.664	498.198	446.619	449.938	424.822	426.520	444.560
Take 02																				
Take 03	332.008	449.538	439.908	418.326	414.698	334.176	419.907	494.333	497.046	442.709	439.535	442.020	589.988	554.093	493.565	440.812	444.849	419.427	420.828	445.413
Take 04	334.113	447.545	441.020	419.463	422.731	334.236	421.626	500.467	498.152	444.889	442.532	448.616	596.564	558.198	499.279	443.319	447.390	426.682	423.134	446.832
Take 05																				
Take 06	331.864	435.484	442.469	418.279	422.326	334.890	416.649	498.021	495.007	438.698	441.963	435.555	594.461	559.603	501.516	440.647	440.945	416.072	414.582	442.914
Take 07	331.223	437.542	444.567	419.661	420.172	336.060	418.685	499.088	496.912	446.796	444.066	440.328	595.277	558.479	501.469	439.971	446.981	417.859	423.264	438.949
Take 08	332.069	445.092	438.866	421.267	420.972	335.846	419.414	499.185	502.220	446.942	442.853	440.096	595.717	560.493	494.367	437.069	446.057	423.697	429.442	504.952
Take 09	331.487	444.338	443.983	422.854	419.764	330.698	420.116	502.284	499.425	444.566	448.939	439.011	593.691	564.613	501.886	441.949	444.895	421.009	423.506	442.434
Take 10	334.878	443.373	443.933	415.871	416.694	335.250	420.295	501.897	502.366	444.140	439.933	445.970	595.186	564.434	500.648	441.185	447.932	422.826	422.901	447.681
Take 11	334.121	445.528	444.753	420.259	420.117	333.040	424.038	499.197	501.634	449.870	445.042	452.340	602.536	556.177	501.390	445.489	447.124	423.629	423.357	445.941
Take 12	332.607	444.525	437.165	420.323	419.846	334.162	418.283	496.550	496.423	448.153	443.508	447.509	599.724	560.509	496.476	441.835	445.737	420.923	422.494	446.464
Take 13	331.201	440.150	442.647	420.413	421.666	335.399	425.156	501.991	501.617	445.797	444.888	442.457	597.827	562.612	504.583	443.369	444.466	420.182	427.195	446.081
Take 14	330.860	442.576	440.708	419.714	420.476	333.712	417.612	498.951	495.139	442.826	439.630	438.806	584.668	559.385	500.213	441.130	442.225	419.386	422.611	444.762
Take 15	330.053	441.156	436.030	418.304	420.469	332.015	418.557	499.223	497.415	438.513	446.789	434.943	591.318	559.337	490.297	437.264	440.923	415.118	421.468	438.726
Take 16	328.397	438.195	432.817	415.290	415.309	335.640	419.336	499.563	495.767	435.184	444.270	445.176	588.947	504.602	503.441	444.576	443.298	419.133	425.495	441.654
Take 17	329.045	440.244	438.701	416.008	416.540	331.039	410.419	499.568	498.731	440.722	441.242	443.839	584.206	503.983	499.871	443.561	441.398	414.571	417.748	439.900
Take 18	328.878	443.440	436.859	419.367	419.779	331.885	423.325	495.819	496.640	441.181	436.805	453.804	593.784	558.037	492.627	438.982	442.334	416.728	419.165	439.538
Take 19	329.271	443.232	436.837	410.458	417.654	326.141	413.456	499.946	495.899	443.227	440.688	440.170	596.466	561.166	499.760	446.234	448.849	420.936	419.266	444.535
Take 20	332.104	447.729	435.632	417.154	413.923	338.956	412.973	496.355	498.598	446.032	438.868	445.805	597.176	557.027	488.824	453.212	442.734	418.335	411.098	444.946
Take 21	331.847	444.368	434.977	413.612	416.820	333.289	415.128	503.933	502.468	438.636	443.102	443.030	591.375	546.830	500.919	447.042	445.366	420.024	419.213	437.846
Sop 1 AVERAGE	331.593	443.276	439.610	418.284	419.040	333.766	418.769	499.118	498.460	443.424	442.502	443.451	593.959	559.039	498.386	442.856	444.918	420.072	421.752	443.288
Cents RF+3rds	9.388	11.939	-2.439	11.470	14.595	20.695	13.477	17.348	15.064	12.517	8.911	12.621	18.528	13.629	14.807	10.297	18.339	18.853	25.766	11.983
Cents RF-3rds	11.089	13.641	-0.738	13.171	16.296	22.396	15.178	19.050	16.765	14.219	10.612	14.322	20.229	15.330	16.508	11.998	20.040	20.555	27.467	13.684
Just Int I	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	-44.860	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Just Int II	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	3.910	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	1.955	0.000	0.000	9.775	9.775	1.955	9.775	3.910	3.910	0.000	0.000	0.000	-1.955	7.820	3.910	0.000	0.000	9.775	9.775	0.000
Meantone	-3.421	0.000	0.000	-17.108	-17.108	-3.421	-17.108	-6.843	-6.843	0.000	0.000	0.000	3.422	-13.686	-6.843	0.000	0.000	-17.108	-17.108	0.000
Take 01	332.981	442.366	445.211	418.102	419.302	336.848	420.201	500.194	496.122	433.951	437.693	452.199	595.956	568.807	504.459	441.854	441.934	422.615	424.862	444.660
Take 02																				
Take 03	331.391	439.699	440.276	407.870	413.534	329.072	415.944	494.379	491.577	438.413	435.495	442.342	594.617	559.001	494.436	439.677	438.723	416.159	413.961	442.364
Take 04	331.819	444.958	442.410	415.793	416.249	329.043	417.034	495.082	496.157	445.010	453.986	439.406	591.347	562.938	495.155	439.471	443.048	415.164	416.434	443.648
Take 05																				
Take 06	330.198	440.818	437.309	415.021	414.217	328.270	418.810	497.960	489.726	438.152	438.806	443.603	591.591	557.835	497.753	433.720	436.362	413.902	414.784	442.232

Take 07	336.087	443.327	440.871	414.084	412.821	335.589	415.538	489.432	488.828	438.524	440.954	445.508	593.141	566.824	497.204	439.740	437.626	414.456	416.571	440.875
Take 08	332.092	447.174	440.595	413.430	413.985	332.036	417.996	498.494	492.448	437.656	442.358	445.911	592.929	567.147	499.115	441.879	437.691	416.671	421.103	447.753
Take 09	329.169	437.978	439.270	412.237	414.281	332.899	417.204	496.590	495.467	442.574	437.717	440.685	597.875	563.051	493.733	440.881	442.097	419.721	420.818	451.405
Take 10	330.289	443.524	435.732	413.901	414.747	331.348	419.018	496.330	492.515	442.312	457.439	449.840	590.069	565.385	499.235	445.807	443.347	419.519	417.938	444.526
Take 11	330.917	447.052	444.342	415.346	414.817	334.373	419.339	496.082	495.793	441.865	436.121	442.323	597.479	561.600	500.565	444.031	438.856	421.186	419.295	451.589
Take 12	330.280	438.954	441.061	418.140	417.436	336.490	418.577	492.382	494.996	444.920	438.514	440.816	597.003	564.592	493.087	437.349	440.163	420.351	419.422	445.626
Take 13	330.073	439.624	437.146	414.557	415.382	329.104	415.875	493.687	491.954	444.480	465.435	439.485	590.734	564.565	496.318	449.672	441.585	420.942	420.897	444.952
Take 14	328.388	441.256	436.113	413.065	411.186	331.171	414.645	492.159	487.325	438.681	444.063	433.537	578.714	564.040	493.455	445.587	446.102	414.650	418.449	441.024
Take 15	327.634	435.139	435.622	412.022	408.737	329.197	415.233	491.848	486.600	436.850	439.068	440.966	585.392	560.974	490.528	438.570	434.445	412.944	415.165	441.081
Take 16	327.040	444.221	435.139	409.486	410.145	331.204	414.236	488.179	494.314	435.479	439.252	439.599	590.786	559.304	491.796	438.153	437.861	410.590	418.168	437.989
Take 17	326.356	436.789	434.850	413.258	413.050	328.539	413.660	490.176	491.052	433.690	433.560	436.135	592.323	558.197	495.592	438.163	437.454	411.339	418.801	437.752
Take 18	326.011	433.343	438.327	411.779	408.833	326.203	416.678	494.092	492.562	440.664	452.914	442.238	591.919	557.450	492.795	439.604	438.815	419.309	418.118	441.730
Take 19	325.203	435.853	437.445	413.561	412.474	332.867	416.818	500.276	494.027	440.880	442.830	435.147	593.633	559.581	495.987	437.553	437.957	419.874	416.957	439.786
Take 20	325.442	436.709	441.246	411.205	412.485	332.257	417.354	497.715	492.583	442.902	439.911	439.251	596.542	566.401	501.735	436.920	439.034	418.827	415.317	440.231
Take 21	331.710	440.185	441.503	414.320	412.172	329.770	416.260	495.458	492.368	437.416	441.716	443.617	540.982	561.324	499.065	444.584	440.415	419.258	422.889	444.978
Sop 2 AVERAGE	**329.636**	**440.472**	**439.182**	**413.536**	**413.466**	**331.383**	**416.864**	**494.764**	**492.443**	**439.706**	**441.553**	**441.134**	**593.137**	**562.580**	**496.422**	**440.696**	**439.659**	**417.236**	**418.418**	**443.379**
Cents RF+3rds	-0.861	0.952	-4.124	-8.294	-8.586	8.291	5.585	2.180	-5.961	-2.061	5.197	3.552	16.131	24.560	7.971	1.830	-2.248	7.126	12.027	12.340
Cents RF-3rds	0.840	2.653	-2.423	-6.593	-6.885	9.992	7.286	3.881	-4.259	-0.359	6.898	5.253	17.832	26.262	9.672	3.532	-0.547	8.828	13.729	14.041
Just Int I	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	-44.860	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Just Int II	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	3.910	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	1.955	0.000	0.000	9.775	9.775	1.955	9.775	3.910	3.910	0.000	0.000	0.000	-1.955	7.820	3.910	0.000	0.000	9.775	9.775	0.000
Meantone	-3.421	0.000	0.000	-17.108	-17.108	-3.421	-17.108	-6.843	-6.843	0.000	0.000	0.000	3.422	-13.686	-6.843	0.000	0.000	-17.108	-17.108	0.000
Take 01	329.623	431.269	438.988	415.094	417.838	328.256	417.009	493.206	495.640	438.831	437.244	432.786	594.845	558.576	490.866	438.726	439.672	420.427	425.055	437.717
Take 02																				
Take 03	325.544	434.680	441.228	412.760	412.913	329.682	416.234	491.766	491.174	436.007	442.463	443.109	595.622	554.717	492.409	437.784	440.203	419.650	414.591	440.022
Take 04	331.801	440.549	444.907	418.221	413.231	331.406	415.963	495.505	491.805	439.993	438.324	441.961	594.584	555.034	491.302	439.574	440.269	422.208	413.324	441.466
Take 05																				
Take 06	328.394	444.339	436.941	415.147	414.233	332.271	419.529	493.040	492.546	443.593	442.020	445.049	587.899	557.047	492.847	438.348	441.516	417.715	414.231	436.031
Take 07	329.189	436.343	434.733	413.683	416.928	330.623	417.226	487.043	488.007	438.494	441.234	433.788	588.695	553.568	494.851	440.411	438.597	412.426	416.677	436.653
Take 08	331.379	446.133	444.163	413.745	415.979	332.158	417.171	493.850	492.324	444.627	437.580	439.212	591.276	556.633	496.573	440.041	440.072	416.379	418.855	439.163
Take 09	327.677	435.858	444.885	421.091	415.010	330.756	416.714	496.746	494.113	435.995	446.922	443.459	593.821	562.014	496.496	444.455	442.925	418.431	418.697	442.244
Take 10	326.631	445.620	443.189	414.440	409.254	331.267	415.043	498.464	494.678	435.047	434.896	442.686	587.927	556.272	488.923	440.805	437.278	411.278	415.385	438.929
Take 11	328.454	437.467	442.830	414.668	419.783	335.617	420.207	499.269	494.734	437.373	438.888	440.583	594.008	557.074	485.977	439.220	441.016	416.365	419.218	437.799
Take 12	330.424	438.000	443.346	419.412	419.655	331.070	421.300	493.904	496.425	433.557	439.900	442.577	595.871	558.350	490.779	440.453	440.877	417.733	416.996	437.983
Take 13	329.653	440.190	438.949	411.899	415.379	329.142	423.024	499.987	493.871	433.341	438.070	443.669	592.573	560.194	484.849	439.648	437.458	418.998	417.274	441.162
Take 14	330.964	433.943	437.490	410.772	409.900	332.369	417.779	485.378	485.959	426.685	448.077	438.533	589.097	555.713	494.527	439.896	437.496	415.003	416.306	440.282
Take 15	328.162	438.079	437.896	416.361	414.341	334.091	415.603	496.770	490.930	444.127	440.134	445.141	588.401	554.400	488.149	438.112	438.716	418.609	412.621	438.075
Take 16	328.476	439.508	437.860	411.230	415.638	325.815	415.163	487.209	486.004	438.289	436.954	437.725	589.242	561.939	494.899	439.939	439.351	414.061	415.732	437.595
Take 17	325.827	440.120	440.371	417.214	415.327	330.158	415.595	490.389	489.039	437.630	438.624	435.836	589.721	555.297	492.758	437.504	437.640	416.650	414.284	431.027
Take 18	328.302	429.926	436.565	411.251	408.813	332.104	414.683	490.628	489.634	434.190	436.001	441.306	590.422	555.246	495.963	436.778	438.287	415.941	415.138	436.674
Take 19	328.527	438.574	441.783	418.269	413.782	332.610	414.176	492.294	487.603	436.785	438.079	434.354	590.680	556.829	492.259	436.979	437.566	414.656	419.388	433.659
Take 20	342.870	435.804	439.683	411.895	421.576	347.569	420.398	500.635	495.490	440.397	433.165	442.392	590.792	556.103	489.651	438.435	439.239	415.030	421.055	439.435
Take 21	328.153	436.340	441.424	411.068	412.026	331.438	414.283	495.412	493.459	437.752	432.629	439.664	591.025	556.794	492.412	435.527	439.793	415.024	419.283	437.009
Sop 3 AVERAGE	**328.732**	**438.039**	**440.381**	**414.643**	**414.446**	**331.157**	**417.216**	**493.763**	**491.760**	**437.511**	**439.011**	**440.202**	**591.395**	**556.937**	**491.921**	**439.086**	**439.367**	**416.662**	**417.058**	**438.049**
Cents RF+3rds	-5.613	-8.637	0.592	-3.664	-4.487	7.112	7.044	-1.326	-8.365	-10.724	-4.801	-0.111	11.037	7.108	-7.798	-4.505	-3.397	4.745	6.390	-8.599
Cents RF-3rds	-3.911	-6.936	2.294	-1.963	-2.786	8.813	8.746	0.375	-6.664	-9.023	-3.100	1.590	12.738	8.809	-6.097	-2.803	-1.696	6.447	8.092	-6.898
Just Int I	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	-44.860	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Just Int II	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	3.910	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	1.955	0.000	0.000	9.775	9.775	1.955	9.775	3.910	3.910	0.000	0.000	0.000	-1.955	7.820	3.910	0.000	0.000	9.775	9.775	0.000
Meantone	-3.421	0.000	0.000	-17.108	-17.108	-3.421	-17.108	-6.843	-6.843	0.000	0.000	0.000	3.422	-13.686	-6.843	0.000	0.000	-17.108	-17.108	0.000
Take 01	332.222	443.139	446.744	422.396	419.396	335.281	418.862	495.809	496.137	441.224	440.681	442.570	597.847	528.533	494.369	442.932	444.407	424.809	422.396	444.683
Take 02																				
Take 03	331.519	439.408	442.934	421.945	415.022	331.013	415.642	495.159	490.661	443.324	443.216	442.368	591.306	547.561	493.091	441.088	438.619	418.969	418.107	441.168
Take 04	329.780	437.973	446.038	417.322	420.419	330.084	418.323	493.221	497.222	443.142	443.216	441.376	591.763	555.523	490.927	442.089	439.685	419.621	420.078	442.319

Take 05																							
Take 06	327.151	437.555	435.276	417.602	419.265	326.350	419.330	497.053	494.378	440.142	440.034	448.773	586.533	553.577	493.257	442.306	440.345	421.271	419.413	441.703			
Take 07	326.552	439.330	438.555	413.913	418.088	334.091	419.353	494.046	491.909	437.027	438.854	440.335	589.773	555.282	488.619	436.382	443.898	420.027	416.281	441.172			
Take 08	328.246	437.245	444.577	422.472	417.514	331.602	418.320	492.421	495.506	439.289	438.470	441.115	594.164	552.109	494.711	445.413	445.014	422.218	419.047	440.550			
Take 09	341.676	440.120	439.535	415.116	417.897	334.654	420.843	499.439	495.530	443.014	442.845	446.107	590.978	564.032	491.932	443.203	440.021	418.753	415.247	442.100			
Take 10	330.438	442.645	443.639	421.424	413.549	328.372	416.307	489.963	493.348	443.307	439.816	443.545	590.177	562.404	492.934	446.627	444.365	419.776	417.069	440.952			
Take 11	332.357	440.514	440.348	423.786	420.012	335.151	420.895	498.770	495.904	447.243	447.303	443.365	599.008	569.008	505.671	443.949	446.007	419.600	423.267	442.118			
Take 12	329.723	441.833	440.137	422.358	418.731	332.009	418.292	496.639	490.859	443.804	439.005	437.500	591.872	559.726	489.272	441.615	438.522	423.368	418.426	441.703			
Take 13	327.561	438.270	441.320	422.090	414.351	331.639	415.261	487.477	486.537	440.344	439.489	438.316	589.105	557.137	489.897	439.570	440.350	422.449	419.420	440.563			
Take 14	331.055	441.671	433.188	414.287	416.481	330.284	416.188	490.326	486.450	437.275	436.364	436.935	584.032	559.286	490.821	441.637	442.758	414.411	411.077	439.855			
Take 15	329.789	434.113	435.778	413.926	414.129	330.309	414.396	489.828	486.069	437.421	439.647	435.277	586.843	558.688	486.052	434.892	439.476	418.249	415.658	437.923			
Take 16	328.785	433.176	437.985	418.535	413.743	328.601	413.793	490.694	486.185	435.474	436.179	437.555	591.814	557.591	491.615	436.752	438.755	417.529	419.550	440.243			
Take 17	325.960	434.687	435.867	415.889	413.673	328.283	412.237	490.260	488.087	436.026	433.677	435.051	588.646	555.495	489.869	438.405	437.709	417.830	417.154	436.298			
Take 18	329.263	433.891	446.074	412.315	410.199	324.005	408.906	485.657	486.419	431.173	436.252	438.221	587.259	557.409	491.169	435.605	436.773	416.061	418.652	437.059			
Take 19	326.781	436.810	437.291	420.678	412.884	327.755	413.041	486.322	484.201	436.779	437.109	437.389	587.741	557.859	491.392	436.561	437.652	415.955	415.894	438.482			
Take 20	335.377	436.732	439.208	418.162	415.112	445.815	422.824	491.991	489.039	431.200	434.576	441.062	575.377	552.895	485.569	438.232	438.080	417.920	416.701	437.599			
Take 21	331.358	438.771	439.420	419.098	413.353	328.046	412.317	486.777	455.982	442.105	434.370	441.516	584.411	558.154	492.656	436.559	434.000	420.068	418.962	438.903			
Sop 4 AVERAGE	330.012	438.310	440.206	418.595	415.990	330.418	416.586	492.203	490.802	439.438	439.005	440.441	590.182	557.430	491.009	440.201	440.339	419.415	418.021	440.284			
Cents RF+3rds	1.114	-7.568	-0.095	12.759	1.952	3.243	4.428	-6.805	-11.739	-3.119	-4.822	0.829	7.483	8.640	-11.011	-0.114	0.428	16.146	10.382	0.212			
Cents RF-3rds	2.815	-5.867	1.607	14.461	3.653	4.945	6.129	-5.104	-10.037	-1.417	-3.121	2.531	9.184	10.341	-9.310	1.587	2.129	17.847	12.083	1.913			
Just Int I	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	-44.860	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000			
Just Int II	1.995	0.000	0.000	-11.731	-11.731	1.995	-11.731	3.910	3.910	0.000	0.000	0.000	-29.219	-13.686	-17.596	0.000	0.000	-11.731	-11.731	0.000			
Pythagorean	1.955	0.000	0.000	9.775	9.775	1.955	9.775	3.910	3.910	0.000	0.000	0.000	-1.955	7.820	3.910	0.000	0.000	9.775	9.775	0.000			
Meantone	-3.421	0.000	0.000	-17.108	-17.108	-3.421	-17.108	-6.843	-6.843	0.000	0.000	0.000	3.422	-13.686	-6.843	0.000	0.000	-17.108	-17.108	0.000			
	Third Phrase																						
	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
Take 01	449.297	449.691	449.841	468.756	477.059	480.133	598.027	525.266	476.176	471.924	444.173	449.305	401.850	405.186	405.927	473.657	447.024	398.194	398.462	353.858	334.023	356.951	333.524
Take 02																							
Take 03	445.677	448.909	442.573	468.605	470.585	474.104	601.175	526.211	472.014	466.667	437.644	446.014	400.232	395.299	403.349	469.045	449.563	394.218	394.875	351.247	335.443	359.005	332.726
Take 04	447.433	451.432	444.356	469.149	468.120	469.651	603.527	527.235	469.035	470.189	438.538	447.498	398.234	396.590	401.285	475.352	446.633	395.286	397.728	348.544	323.195	358.443	331.084
Take 05																							
Take 06	444.999	442.738	441.586	469.459	468.115	463.898	590.666	521.661	467.884	463.247	440.258	442.786	395.165	398.516	395.932	472.402	444.913	391.035	393.036	350.549	332.756	354.634	332.210
Take 07	445.623	448.399	444.933	466.182	467.212	470.173	596.795	522.708	470.828	466.166	439.674	443.845	398.006	394.631	395.663	468.163	443.527	394.176	394.828	347.080	333.391	355.879	330.301
Take 08	443.354	451.203	440.175	466.356	468.235	470.555	593.287	525.000	465.157	464.796	441.618	443.432	396.781	393.750	396.278	466.292	441.104	392.895	395.911	345.921	330.618	355.530	329.010
Take 09	446.295	446.009	441.742	464.937	467.491	470.783	596.695	525.124	470.579	470.849	439.314	445.335	396.175	396.207	401.111	470.111	447.629	389.819	394.196	351.411	330.791	352.862	333.447
Take 10	447.610	448.951	449.291	473.933	474.052	475.359	596.041	524.674	472.772	472.584	442.943	444.470	400.797	401.144	400.023	478.961	448.004	395.761	395.098	355.236	334.044	353.498	331.014
Take 11	451.016	449.340	443.519	474.648	473.829	480.179	596.985	525.294	471.837	470.535	442.029	442.634	400.718	398.744	405.581	478.093	447.094	398.003	397.036	358.495	333.511	358.735	332.905
Take 12	449.253	448.655	438.278	466.642	471.129	480.860	591.865	529.220	469.953	469.171	442.125	447.747	392.232	394.231	401.116	471.273	442.833	394.852	395.406	357.337	334.389	354.497	331.313
Take 13	447.429	449.619	441.618	472.935	472.813	472.626	596.512	524.876	471.087	465.984	445.642	445.571	397.404	391.751	400.356	475.549	446.264	398.816	394.694	351.008	323.391	355.600	331.038
Take 14	442.442	441.613	445.454	461.672	465.136	464.905	576.713	514.786	460.032	462.818	436.505	444.654	393.578	392.656	393.385	467.627	446.723	389.971	388.775	349.840	330.647	351.022	329.387
Take 15	442.415	439.900	439.272	464.526	465.358	466.894	589.845	523.615	464.304	462.334	437.424	438.857	394.928	389.843	392.666	466.031	439.913	392.688	389.876	348.228	329.628	351.293	333.304
Take 16	443.141	446.566	443.155	467.956	467.146	469.961	574.987	523.839	470.424	466.524	440.477	442.649	395.257	391.379	394.451	465.921	440.663	395.464	391.259	347.590	333.670	351.379	327.717
Take 17	445.606	443.549	441.986	463.808	466.671	460.822	583.120	524.218	470.377	460.432	443.391	447.423	395.618	389.955	396.987	471.172	444.989	390.396	389.079	353.062	336.581	351.402	328.328
Take 18	443.782	442.681	441.419	461.498	467.050	467.870	596.053	524.379	470.595	462.460	432.000	443.635	395.308	400.006	393.895	469.992	444.721	398.077	393.700	351.376	330.458	350.645	328.349
Take 19	445.129	444.844	441.198	465.530	468.613	463.498	591.242	524.896	469.327	466.271	432.513	444.026	395.632	397.544	399.583	472.957	439.810	393.454	393.109	346.398	333.434	353.247	327.715
Take 20	449.398	442.731	434.899	477.065	471.852	471.028	598.721	526.068	467.614	470.374	440.140	443.288	396.323	398.771	395.192	471.760	443.281	397.728	391.260	343.312	340.820	355.145	327.777
Take 21	445.037	445.620	449.517	470.715	468.377	473.136	600.235	526.598	472.417	469.033	442.684	449.504	399.232	395.263	398.976	472.850	442.493	402.128	393.210	349.922	338.787	358.416	325.365
Sop 1 AVERAGE	446.049	446.445	442.885	468.125	469.413	470.865	593.289	524.509	469.601	466.966	439.952	444.877	397.025	395.867	398.513	471.432	444.589	394.893	393.765	350.548	332.609	354.641	330.343
Cents RF+3rds	16.914	18.448	4.587	0.542	5.298	10.646	10.752	-2.569	5.991	-3.748	-6.914	12.359	15.345	10.287	21.824	12.730	11.235	6.022	1.072	-0.196	8.865	19.903	-2.974
Cents RF-3rds	21.181	22.716	8.855	4.809	9.566	14.913	15.019	1.698	10.258	0.519	-2.647	16.627	19.612	14.555	26.091	16.997	15.502	10.289	5.340	4.072	13.132	24.170	1.294
Just Int I	0.000	0.000	0.000	4.955	4.955	-37.039	-1.955	7.820	-37.039	-37.039	-21.506	-21.506	-25.416	-25.416	-52.680	-9.774	-21.506	-52.680	-52.680	-7.820	-19.551	-14.596	-19.551
Just Int II	0.000	0.000	0.000	4.955	4.955	-15.532	19.551	29.326	-15.532	-15.532	0.000	0.000	-3.910	-3.910	-31.174	11.732	0.000	-31.174	-31.174	13.686	1.955	6.910	1.955
Pythagorean	0.000	0.000	0.000	-9.775	-9.775	-9.775	-1.955	-5.865	-9.775	-9.775	0.000	0.000	-3.910	-3.910	-3.910	-9.775	0.000	-3.910	-3.910	-7.820	1.955	-7.820	1.955
Meantone	0.000	0.000	0.000	17.107	17.107	17.107	3.422	10.265	17.107	17.107	0.000	0.000	6.843	6.843	6.843	17.107	0.000	6.843	6.843	13.686	1.955	13.686	1.955

Take 01	449.685	447.642	445.953	464.322	474.651	473.990	593.617	530.016	471.085	470.704	444.843	456.708	396.919	395.063	398.719	472.591	447.538	392.188	391.246	358.981	333.922	355.148	334.392
Take 02																							
Take 03	444.780	443.870	440.915	469.211	469.671	469.454	570.072	527.730	467.524	465.280	441.669	444.603	396.828	393.499	397.817	465.478	444.055	390.479	391.183	348.971	328.696	350.945	331.306
Take 04	446.975	444.079	448.280	463.077	470.083	468.765	531.930	524.220	472.613	471.266	447.642	444.208	395.311	394.981	396.034	466.854	438.305	393.887	390.019	347.556	331.579	351.632	333.075
Take 05																							
Take 06	445.056	443.423	444.267	461.465	466.364	464.934	591.858	521.837	459.797	467.097	445.637	442.504	394.482	390.514	396.596	461.145	437.446	391.491	394.024	348.818	331.735	351.748	331.938
Take 07	446.485	445.795	441.702	461.305	464.738	466.932	594.451	519.188	469.222	460.236	446.082	442.495	394.889	389.634	398.494	467.913	446.181	394.090	392.262	348.015	328.327	351.253	330.813
Take 08	445.219	441.269	442.356	460.290	463.921	466.076	597.966	523.385	469.829	463.230	445.669	449.583	395.446	393.792	393.640	467.736	438.391	393.879	391.019	348.275	331.170	352.974	331.741
Take 09	446.943	441.724	440.835	461.474	465.480	466.667	592.443	525.000	468.728	464.476	445.334	442.358	392.405	390.371	396.136	472.223	445.806	391.220	392.683	351.826	331.501	350.419	331.003
Take 10	448.229	448.809	447.797	467.473	468.511	471.225	589.815	527.033	470.177	470.799	448.762	448.541	397.571	394.581	400.282	468.726	446.782	393.296	391.213	356.055	334.042	352.624	331.477
Take 11	451.396	447.039	444.586	464.855	471.894	469.351	611.933	525.759	471.913	470.717	456.995	447.773	396.814	397.991	399.477	471.720	447.626	395.083	395.089	352.304	333.290	351.545	333.550
Take 12	449.199	445.087	442.960	465.002	467.511	466.082	583.333	517.513	467.413	466.394	442.732	449.490	391.552	395.867	395.470	465.845	442.706	392.572	388.611	345.840	330.023	350.440	329.671
Take 13	445.836	446.251	442.733	465.295	467.244	466.208	595.359	524.447	465.745	466.485	442.732	446.959	391.603	397.518	392.953	469.863	439.257	388.723	391.152	346.190	332.273	354.106	330.396
Take 14	445.033	440.127	438.193	466.403	465.071	463.593	574.162	521.718	465.690	462.119	442.383	437.602	392.004	385.389	392.739	459.635	445.367	388.755	391.788	345.015	329.277	351.166	331.513
Take 15	448.832	441.283	440.292	464.549	465.703	462.393	581.904	520.529	462.992	467.656	434.374	441.842	389.753	394.753	392.690	461.897	445.143	388.314	389.526	350.468	331.375	348.722	330.296
Take 16	439.504	441.395	443.140	461.703	462.643	463.871	584.922	518.604	463.601	465.007	439.853	436.595	391.152	394.190	391.974	464.117	438.358	391.456	390.679	344.065	330.209	348.936	328.713
Take 17	439.892	438.370	438.625	457.997	466.026	466.324	588.633	517.612	463.974	463.822	437.536	441.668	392.453	390.891	391.396	467.172	441.976	390.727	388.268	345.039	330.119	348.953	328.254
Take 18	442.139	445.396	440.194	462.046	468.219	464.002	488.793	521.104	465.615	466.945	443.008	431.707	391.103	383.270	391.345	463.393	442.948	383.095	387.215	347.792	326.158	347.641	328.402
Take 19	438.488	442.193	443.662	463.640	463.873	466.304	599.444	520.586	466.108	463.242	442.048	441.401	391.366	388.534	390.469	462.121	439.181	394.696	389.423	349.486	331.950	350.200	329.250
Take 20	441.941	442.119	443.082	464.427	468.460	473.887	587.355	524.649	469.036	468.814	442.655	445.689	389.484	385.253	392.445	465.713	438.015	385.464	385.644	349.199	332.981	351.280	329.563
Take 21	445.273	442.204	440.982	464.875	468.600	464.992	545.621	523.805	470.138	468.067	444.813	441.453	395.118	388.935	394.253	468.833	442.918	387.399	390.717	353.157	329.384	355.091	330.131
Sop 2 AVERAGE	445.311	443.583	442.661	463.653	467.298	467.108	589.662	522.881	467.432	466.440	443.935	443.851	393.487	391.843	394.891	466.472	442.526	390.885	390.619	349.318	330.948	351.306	330.815
Cents RF+3rds	14.045	7.315	3.712	-16.075	-2.519	-3.223	0.135	-7.952	-2.024	-5.701	8.689	8.362	-0.151	-7.398	6.015	-5.580	3.185	-11.637	-12.816	-6.279	0.195	3.546	-0.500
Cents RF-3rds	18.312	11.582	7.979	-11.808	1.748	1.044	4.402	-3.685	2.243	-1.434	12.956	12.629	4.116	-3.131	10.282	-1.313	7.452	-7.370	-8.549	-2.011	4.462	7.813	3.767
Just Int I	0.000	0.000	0.000	4.955	4.955	-37.039	-1.955	7.820	-37.039	-37.039	-21.506	-21.506	-25.416	-25.416	-52.680	-9.774	-21.506	-52.680	-52.680	-7.820	-19.551	-14.596	-19.551
Just Int II	0.000	0.000	0.000	4.955	4.955	-15.532	19.551	29.326	-15.532	-15.532	0.000	0.000	-3.910	-3.910	-31.174	11.732	0.000	-31.174	-31.174	13.686	1.955	6.910	1.955
Pythagorean	0.000	0.000	0.000	-9.775	-9.775	-9.775	-1.955	-5.865	-9.775	-9.775	0.000	0.000	-3.910	-3.910	-3.910	-9.775	0.000	-3.910	-3.910	-7.820	1.955	-7.820	1.955
Meantone	0.000	0.000	0.000	17.107	17.107	17.107	3.422	10.265	17.107	17.107	0.000	0.000	6.843	6.843	6.843	17.107	0.000	6.843	6.843	13.686	1.955	13.686	1.955
Take 01	436.966	436.960	441.795	463.841	466.312	466.201	583.307	518.223	464.425	464.373	441.092	438.622	389.777	390.958	394.164	464.596	439.475	382.530	389.500	356.124	329.213	345.937	329.169
Take 02																							
Take 03	439.504	438.689	439.820	453.048	459.607	462.486	583.348	521.464	468.335	461.793	439.599	440.271	387.552	387.579	394.723	459.959	439.709	382.291	387.875	346.148	332.265	347.616	329.547
Take 04	441.373	438.821	441.219	461.227	461.214	464.955	592.357	522.077	468.261	461.906	435.060	436.913	392.327	396.262	388.135	456.711	436.757	383.072	389.546	354.420	331.159	345.601	327.895
Take 05																							
Take 06	439.026	444.748	443.139	460.569	461.225	464.097	580.124	517.662	466.510	461.323	436.788	434.794	392.751	391.467	396.610	458.532	431.813	387.845	385.903	339.116	327.536	346.125	328.438
Take 07	437.961	445.483	438.590	461.623	466.389	459.649	586.778	521.919	471.018	467.205	435.804	438.256	394.009	386.367	392.577	466.614	438.309	395.321	387.781	345.555	324.507	347.024	329.318
Take 08	440.429	440.053	445.621	454.518	465.493	464.785	585.877	523.065	470.294	465.273	440.096	439.747	395.356	393.982	397.086	458.811	433.752	390.895	390.134	339.875	320.805	349.945	331.223
Take 09	441.351	446.412	448.226	455.698	465.821	465.107	582.834	518.181	475.032	465.822	437.895	437.404	396.262	392.923	395.782	467.292	440.219	393.617	392.341	343.846	323.861	348.026	330.553
Take 10	440.355	446.374	445.924	468.110	467.337	468.875	591.093	518.701	468.640	464.081	436.229	438.691	395.885	395.615	398.893	457.674	443.036	387.220	387.993	348.564	329.397	347.591	326.145
Take 11	441.684	444.056	440.536	467.451	465.156	469.819	585.023	522.603	473.625	465.460	440.930	437.245	395.020	391.923	399.691	465.125	437.400	386.381	385.469	339.978	335.929	346.222	327.682
Take 12	440.135	442.587	443.173	463.109	466.083	464.924	582.280	518.794	465.335	461.819	435.118	437.487	391.030	393.686	395.287	458.151	442.137	386.172	390.156	347.422	329.587	348.924	325.762
Take 13	440.773	441.532	441.934	463.701	467.467	463.544	579.508	517.309	461.694	459.702	435.058	438.367	393.235	390.587	393.056	462.942	437.375	388.637	389.143	341.290	329.756	348.226	328.111
Take 14	440.714	441.100	437.222	459.961	460.863	462.071	579.952	519.212	467.261	461.229	435.187	435.893	391.156	392.000	394.162	468.265	437.643	385.839	388.797	343.435	334.483	348.712	327.288
Take 15	434.558	436.332	438.052	455.306	460.853	461.500	586.848	518.394	464.583	456.810	436.951	439.449	397.359	394.442	397.588	465.468	440.132	389.735	389.008	349.058	330.944	348.664	328.118
Take 16	439.348	445.952	439.670	461.541	463.830	461.665	580.927	513.359	461.195	462.406	436.738	433.682	398.071	394.208	395.396	460.588	434.418	389.773	392.964	346.143	330.134	346.831	328.378
Take 17	441.407	439.079	438.765	457.091	462.835	461.188	577.264	517.741	467.352	457.642	443.896	437.739	393.684	392.448	395.345	461.982	437.538	390.059	389.261	347.365	322.656	346.532	331.522
Take 18	444.107	443.065	443.351	463.235	465.538	471.052	586.107	520.466	468.916	463.400	428.829	438.302	393.131	390.409	397.115	459.200	428.583	382.839	388.406	343.481	318.717	345.953	327.420
Take 19	444.864	440.732	440.396	455.854	461.785	459.322	584.081	513.089	466.008	463.457	430.220	439.015	397.574	390.657	398.619	463.593	432.595	386.955	394.072	344.244	326.103	346.159	326.738
Take 20	438.987	438.806	444.153	454.856	465.578	469.409	583.536	519.977	467.904	460.456	442.116	440.589	394.794	391.741	389.865	463.460	440.319	377.730	385.220	349.818	325.266	342.808	328.185
Take 21	442.914	442.722	443.788	464.780	468.503	468.159	569.924	516.257	462.763	464.888	436.634	440.506	393.899	389.766	396.440	467.111	436.297	380.323	385.210	345.713	318.593	348.173	323.063
Sop 3 AVERAGE	440.340	441.763	441.862	460.290	464.310	464.674	583.219	518.868	467.324	462.581	437.065	438.051	393.835	391.948	395.291	462.425	437.237	387.195	388.883	345.873	327.416	347.109	328.134
Cents RF+3rds	-5.390	0.198	0.584	-28.677	-13.625	-12.267	-18.884	-21.289	-2.423	-20.081	-18.312	-14.411	1.381	-6.933	7.769	-20.667	-17.631	-28.059	-20.526	-23.437	-18.379	-17.264	-14.586
Cents RF-3rds	-1.123	4.465	4.851	-24.410	-9.357	-8.000	-14.617	-17.022	1.844	-15.814	-14.045	-10.143	5.648	-2.666	12.036	-16.400	-13.364	-23.792	-16.259	-19.170	-14.111	-12.997	-10.318
Just Int I	0.000	0.000	0.000	4.955	4.955	-37.039	-1.955	7.820	-37.039	-37.039	-21.506	-21.506	-25.416	-25.416	-52.680	-9.774	-21.506	-52.680	-52.680	-7.820	-19.551	-14.596	-19.551
Just Int II	0.000	0.000	0.000	4.955	4.955	-15.532	19.551	29.326	-15.532	-15.532	0.000	0.000	-3.910	-3.910	-31.174	11.732	0.000	-31.174	-31.174	13.686	1.955	6.910	1.955

Pythagorean	0.000	0.000	0.000	-9.775	-9.775	-9.775	-1.955	-5.865	-9.775	-9.775	0.000	0.000	-3.910	-3.910	-3.910	-9.775	0.000	-3.910	-3.910	-7.820	1.955	-7.820	1.955
Meantone	0.000	0.000	0.000	17.107	17.107	17.107	3.422	10.265	17.107	17.107	0.000	0.000	6.843	6.843	6.843	17.107	0.000	6.843	6.843	13.686	1.955	13.686	1.955
Take 01	443.095	443.928	444.805	467.288	468.293	466.434	585.374	530.023	460.659	464.051	445.067	444.112	400.356	398.098	401.340	472.859	444.579	395.274	398.597	355.841	333.068	355.223	332.721
Take 02																							
Take 03	440.119	439.313	440.345	460.490	462.110	460.007	579.012	519.424	458.363	461.506	439.960	443.003	394.680	399.063	393.842	461.310	437.437	385.268	392.689	350.902	331.846	349.054	330.337
Take 04	443.083	440.801	442.206	463.299	459.914	459.892	581.302	520.360	464.628	463.352	443.322	440.596	394.434	397.563	396.108	463.757	444.057	390.653	392.886	350.168	332.144	353.325	330.137
Take 05																							
Take 06	442.899	438.745	441.421	461.641	459.993	461.853	573.919	519.295	462.952	461.803	437.920	436.497	392.329	397.840	396.990	459.398	436.922	393.040	394.322	350.576	328.790	349.000	327.857
Take 07	443.764	438.806	442.492	463.619	462.839	462.931	580.874	517.666	468.091	462.822	442.858	445.175	394.890	399.594	392.619	465.065	440.060	387.365	390.978	349.208	329.304	351.363	330.166
Take 08	444.195	442.261	440.112	461.421	461.642	461.465	583.733	520.461	462.117	460.612	438.272	441.792	392.541	395.194	396.763	463.553	441.124	388.731	394.029	346.451	328.798	349.215	327.724
Take 09	444.648	441.359	444.056	468.951	461.554	461.849	584.268	523.309	464.914	460.907	435.425	441.660	394.983	393.863	396.101	465.875	438.448	392.640	390.984	346.625	328.186	346.722	327.988
Take 10	439.916	441.591	439.773	462.501	462.466	466.542	589.123	519.457	468.145	461.594	439.415	438.758	391.553	396.495	394.121	468.240	439.091	390.520	392.086	355.839	335.651	350.038	329.004
Take 11	444.598	446.707	447.076	469.842	467.043	467.098	583.889	528.483	468.538	465.351	443.982	442.554	395.243	397.908	393.987	468.193	442.513	391.980	393.948	350.574	328.055	352.466	328.560
Take 12	442.729	443.332	444.242	464.070	464.251	464.839	584.078	519.791	462.271	464.019	440.965	439.929	392.446	398.014	397.453	463.227	440.828	387.522	389.296	349.258	347.505	350.862	331.233
Take 13	441.329	440.710	437.209	459.420	462.196	467.546	583.447	521.210	461.313	464.102	435.796	440.417	392.661	394.542	399.185	457.110	434.727	386.950	389.398	349.722	328.985	349.945	328.617
Take 14	443.552	441.999	438.795	462.508	459.100	458.879	576.028	517.654	463.600	456.338	432.252	440.674	390.151	390.793	389.337	461.101	438.874	388.826	386.183	346.574	325.810	346.165	328.102
Take 15	438.348	437.042	441.268	459.694	457.809	458.254	577.839	516.669	460.602	457.301	434.113	436.087	388.597	392.508	389.547	461.636	436.820	384.951	385.719	341.913	321.533	342.600	326.741
Take 16	437.868	441.178	438.327	461.315	463.003	456.501	577.696	516.525	461.322	459.261	435.452	439.113	391.387	389.245	394.888	461.809	437.832	388.583	388.468	355.080	325.671	347.877	328.841
Take 17	438.354	439.038	436.949	459.979	459.553	451.902	572.688	513.700	459.956	458.087	436.471	442.372	388.820	392.482	389.014	461.801	439.384	387.065	386.835	347.604	323.456	347.316	327.809
Take 18	440.049	439.714	439.319	457.913	460.841	462.152	579.836	515.287	459.066	459.072	436.779	443.486	390.450	390.392	383.128	454.485	435.031	382.332	385.110	344.401	323.878	345.402	328.534
Take 19	439.578	438.375	439.182	465.442	461.847	457.587	580.365	516.972	461.323	458.807	433.951	441.871	390.941	392.979	389.632	459.984	430.405	387.236	386.343	345.861	327.570	345.753	326.106
Take 20	435.069	442.209	436.616	455.513	453.539	457.450	579.674	504.842	453.237	459.398	442.722	438.279	390.500	395.293	384.890	455.679	437.717	383.852	386.148	346.101	333.542	348.353	328.895
Take 21	436.937	439.219	434.647	464.927	457.902	446.959	422.090	486.342	463.444	462.526	436.448	441.096	393.568	396.944	391.284	457.249	445.937	387.763	388.502	346.766	321.898	351.039	330.475
Sop 4 AVERAGE	441.059	440.859	440.465	462.623	461.363	461.288	580.730	519.782	462.344	461.100	438.483	440.919	392.659	395.201	393.170	462.228	439.041	388.450	390.133	348.919	329.247	349.038	328.939
Cents RF+3rds	-2.562	-3.348	-4.896	-19.927	-24.648	-24.929	-26.288	-18.243	-20.969	-25.633	-12.706	-3.112	-3.796	7.372	-1.547	-21.405	-10.502	-22.455	-14.972	-8.258	-8.727	-7.670	-10.344
Cents RF-3rds	1.705	0.919	-0.629	-15.659	-20.380	-20.662	-22.021	-13.976	-16.702	-21.366	-8.439	1.155	0.472	11.639	2.720	-17.137	-6.235	-18.188	-10.705	-3.991	-4.460	-3.403	-6.077
Just Int I	0.000	0.000	0.000	4.955	4.955	-37.039	-1.955	7.820	-37.039	-37.039	-21.506	-21.506	-25.416	-25.416	-52.680	-9.774	-21.506	-52.680	-52.680	-7.820	-19.551	-14.596	-19.551
Just Int II	0.000	0.000	0.000	4.955	4.955	-15.532	19.551	29.326	-15.532	-15.532	0.000	0.000	-3.910	-3.910	-31.174	11.732	0.000	-31.174	-31.174	13.686	1.955	6.910	1.955
Pythagorean	0.000	0.000	0.000	-9.775	-9.775	-9.775	-1.955	-5.865	-9.775	-9.775	0.000	0.000	-3.910	-3.910	-3.910	-9.775	0.000	-3.910	-3.910	-7.820	1.955	-7.820	1.955
Meantone	0.000	0.000	0.000	17.107	17.107	17.107	3.422	10.265	17.107	17.107	0.000	0.000	6.843	6.843	6.843	17.107	0.000	6.843	6.843	13.686	1.955	13.686	1.955

Fourth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
Take 01	372.456	372.665	374.467	331.786	301.163	399.065	397.807	404.716	395.516	377.701	336.600	450.852	449.022	396.271	448.906	513.062	371.040	333.476	374.788	396.704
Take 02																				
Take 03	373.233	373.787	374.079	336.891	307.000	401.948	397.288	402.034	391.315	381.613	337.177	438.972	443.463	394.274	443.290	501.137	370.155	333.754	375.467	392.622
Take 04	371.701	371.705	376.414	332.003	297.915	400.700	397.189	399.155	394.727	369.778	334.695	442.709	443.227	398.328	445.372	505.216	369.754	330.849	390.927	397.333
Take 05																				
Take 06	370.122	372.038	371.483	328.303	294.226	400.744	390.454	399.142	397.485	375.569	337.285	441.971	443.666	390.078	443.119	501.589	369.696	332.915	378.956	397.316
Take 07	369.725	369.471	368.851	328.666	294.278	393.212	392.780	399.344	395.094	372.685	331.081	441.871	443.931	387.923	442.564	503.796	369.471	331.893	377.491	394.355
Take 08	369.986	370.569	368.317	330.374	297.736	400.663	393.056	399.220	394.700	371.542	337.055	447.306	444.332	395.080	445.538	503.558	370.064	330.622	369.038	394.389
Take 09	369.842	370.821	372.970	330.988	297.595	400.285	394.058	403.709	393.541	374.815	332.062	441.000	444.157	393.923	447.901	504.976	367.956	331.890	371.829	398.767
Take 10	371.680	372.828	370.506	334.624	296.126	397.568	398.431	398.057	394.141	380.473	332.386	444.382	446.052	397.263	445.373	504.610	372.695	330.105	377.321	396.292
Take 11	371.022	372.000	371.165	330.936	303.308	402.330	398.835	398.591	392.362	376.952	337.135	451.478	446.435	401.478	444.512	509.748	372.498	332.709	378.634	400.706
Take 12	369.663	369.725	368.232	329.985	301.924	397.939	395.530	397.164	392.461	371.432	332.970	444.727	443.544	395.173	449.356	500.695	373.541	329.638	373.583	399.286
Take 13	371.997	374.117	367.086	334.518	303.248	399.776	396.804	404.439	397.412	380.284	337.387	445.905	444.274	394.307	444.351	491.014	376.396	330.130	375.415	396.987
Take 14	367.190	368.771	370.302	330.546	297.031	399.505	394.215	395.535	390.499	368.762	333.029	441.427	442.635	395.681	442.483	505.007	369.715	331.011	367.708	391.985
Take 15	367.868	369.649	368.023	329.546	298.414	397.751	390.423	392.741	389.088	366.696	327.389	438.603	439.999	390.819	444.556	505.175	369.580	329.610	369.682	394.587
Take 16	369.966	372.931	370.436	328.752	293.580	396.726	391.353	396.365	388.083	370.997	337.142	440.955	441.139	390.197	440.583	502.028	370.251	328.242	369.817	390.726
Take 17	368.380	372.112	368.014	329.991	297.718	396.802	392.138	397.068	390.266	370.782	336.325	440.225	444.073	393.231	441.871	506.962	369.499	329.955	378.000	393.352
Take 18	369.416	370.728	370.147	327.696	295.187	396.367	392.992	398.780	388.725	371.238	331.406	436.707	442.564	392.776	439.339	501.197	373.170	328.052	368.007	392.552
Take 19	368.273	366.371	366.415	327.536	297.135	391.926	390.821	394.692	394.450	368.390	335.106	441.364	442.171	397.030	439.314	499.245	370.962	331.170	370.557	391.563
Take 20	369.472	367.395	362.941	329.994	300.562	396.754	391.590	395.685	390.535	378.866	332.155	445.531	444.570	394.236	447.716	503.770	369.818	330.524	374.577	392.857
Take 21	370.676	368.928	368.114	333.887	298.553	391.447	397.303	393.995	391.956	380.950	343.335	439.737	450.921	392.523	449.312	516.563	376.830	345.689	380.396	391.013
Sop 1 AVERAGE	370.140	370.874	369.893	330.896	298.563	397.974	394.372	398.444	392.756	374.185	334.827	442.933	444.220	394.242	444.498	502.925	371.215	330.919	373.959	394.915

Cents RF+3rds	0.186	3.615	-0.973	6.152	28.141	25.708	9.967	27.750	2.857	19.003	26.599	11.004	16.027	9.395	17.110	30.910	5.206	6.274	17.956	12.351
Cents RF-3rds	4.095	7.524	2.936	10.061	32.050	29.617	13.876	31.659	6.766	22.912	30.508	14.913	19.936	13.304	21.019	34.819	9.115	10.182	21.865	16.259
Just Int I	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Just Int II	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Pythagorean	7.820	7.820	7.820	3.910	0.000	-1.955	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	-1.955	1.955	5.865	7.820	3.910	7.820	-1.955
Meantone	-13.686	-13.686	-13.686	-6.843	0.000	3.422	3.422	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	3.422	-3.421	-10.264	-13.686	-6.843	-13.686	3.422
Take 01	371.519	362.733	373.242	331.439	297.844	396.578	394.276	397.040	393.011	371.592	334.318	444.569	445.344	396.454	448.754	502.043	371.474	329.633	371.947	394.821
Take 02																				
Take 03	369.523	370.436	371.391	332.445	296.433	390.411	393.314	395.018	393.734	371.002	327.464	446.693	444.955	394.698	442.173	499.954	369.821	331.691	370.048	393.618
Take 04	369.810	369.409	372.599	333.427	295.872	392.332	393.803	396.370	395.039	375.083	335.084	454.321	443.282	395.798	446.667	497.993	372.909	330.147	376.198	395.769
Take 05																				
Take 06	370.935	370.368	372.169	329.779	297.494	389.641	392.713	393.103	392.702	370.506	333.156	443.905	440.500	396.593	443.691	496.647	367.078	328.736	372.710	394.662
Take 07	369.159	368.750	367.943	327.502	296.527	392.765	391.144	397.576	393.905	368.421	324.862	447.468	440.389	387.701	445.102	492.349	369.440	328.907	371.514	392.313
Take 08	369.125	370.464	371.700	331.261	295.428	390.858	393.959	396.558	393.112	371.266	327.111	448.107	442.573	394.116	448.094	498.991	368.530	330.223	369.836	398.941
Take 09	371.641	377.232	370.674	326.097	295.668	390.632	393.123	394.910	393.750	371.581	331.241	444.609	442.025	388.992	443.281	494.909	367.590	330.409	371.415	393.648
Take 10	370.638	371.474	370.807	331.941	293.375	392.413	395.419	393.570	394.392	374.158	333.045	449.809	444.288	396.119	443.555	493.860	370.628	329.396	371.377	393.345
Take 11	370.856	365.945	372.152	331.989	296.584	399.082	395.682	393.270	395.490	371.078	332.386	449.638	445.015	393.402	445.426	498.802	369.609	335.196	379.923	398.958
Take 12	367.348	368.488	367.637	334.415	293.291	395.161	391.357	388.143	395.637	371.513	329.055	445.386	442.818	396.728	445.454	492.803	367.120	331.236	371.078	396.737
Take 13	370.100	367.617	370.270	331.040	294.273	395.107	393.047	395.916	388.546	372.518	330.625	449.289	443.521	395.460	447.971	494.368	368.443	329.577	371.389	393.723
Take 14	367.844	368.949	370.763	327.328	296.816	396.568	392.076	391.312	392.828	369.232	327.759	443.179	440.115	393.227	442.042	488.106	368.631	326.316	367.602	391.207
Take 15	366.007	367.599	370.503	327.761	291.738	387.794	393.470	390.184	388.462	367.574	326.143	441.705	438.424	386.814	437.030	490.431	366.441	327.637	367.781	392.472
Take 16	368.390	364.616	366.619	326.067	295.303	389.474	389.384	392.174	390.794	371.585	334.476	437.868	436.641	386.874	441.000	494.398	366.766	328.802	370.744	388.399
Take 17	368.158	367.358	366.021	327.226	295.074	389.858	388.899	392.281	390.063	371.185	331.321	438.120	440.580	386.727	440.728	489.449	365.378	327.335	372.444	389.259
Take 18	366.992	368.316	367.983	325.012	291.922	388.082	390.508	394.297	391.711	367.057	326.964	442.159	440.948	393.604	442.261	494.757	368.624	328.997	368.682	389.500
Take 19	366.490	367.424	369.467	329.031	292.440	392.249	391.187	391.473	392.264	368.960	327.826	447.116	442.414	389.854	442.111	496.219	366.884	328.674	371.120	394.909
Take 20	367.365	366.934	370.075	331.660	293.023	392.897	390.958	389.398	389.834	368.739	328.686	440.881	441.204	395.400	441.251	497.665	371.674	331.253	374.314	392.901
Take 21	368.999	366.994	372.091	331.335	297.418	392.813	391.591	390.070	396.393	371.066	330.634	443.887	443.373	392.473	442.652	501.662	366.097	332.812	374.972	406.622
Sop 2 AVERAGE	**368.995**	**368.479**	**370.216**	**329.829**	**295.080**	**392.353**	**392.416**	**393.298**	**392.719**	**370.743**	**330.113**	**445.195**	**442.021**	**392.686**	**443.644**	**495.548**	**368.586**	**329.841**	**371.847**	**393.621**
Cents RF+3rds	-5.181	-7.601	0.540	0.562	7.827	1.083	1.361	5.247	2.697	3.002	2.053	19.824	7.439	2.551	13.783	5.328	-7.099	0.622	8.150	6.668
Cents RF-3rds	-1.272	-3.692	4.449	4.471	11.736	4.992	5.270	9.155	6.606	6.911	5.962	23.733	11.347	6.459	17.692	9.236	-3.190	4.531	12.059	10.577
Just Int I	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Just Int II	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Pythagorean	7.820	7.820	7.820	3.910	0.000	-1.955	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	-1.955	1.955	5.865	7.820	3.910	7.820	-1.955
Meantone	-13.686	-13.686	-13.686	-6.843	0.000	3.422	3.422	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	3.422	-3.421	-10.264	-13.686	-6.843	-13.686	3.422
Take 01	369.917	366.752	368.726	329.638	295.374	385.549	390.619	395.009	394.627	370.483	334.286	441.101	440.647	388.086	437.948	493.046	373.293	332.437	371.958	389.255
Take 02																				
Take 03	369.902	368.477	373.047	333.933	298.720	391.771	387.356	391.295	395.544	364.184	328.614	440.172	437.867	392.626	440.795	489.041	373.082	329.172	369.221	391.756
Take 04	367.733	375.129	371.269	330.864	299.700	392.257	389.524	391.189	394.268	372.927	332.516	451.151	442.716	393.940	445.085	505.563	369.466	329.887	378.487	391.109
Take 05																				
Take 06	360.596	378.793	366.352	328.500	295.940	385.172	387.743	392.512	392.309	371.010	328.735	441.412	440.735	389.189	438.816	491.811	370.319	330.683	374.536	387.595
Take 07	369.854	369.012	368.135	331.147	295.605	394.332	389.992	388.889	395.780	375.733	326.667	446.348	442.479	394.639	434.396	489.563	367.050	328.284	372.764	393.692
Take 08	370.050	370.690	371.352	331.769	295.352	398.954	391.874	389.632	394.498	374.608	325.942	445.842	438.498	388.714	440.685	490.501	370.736	332.595	374.557	390.219
Take 09	373.469	371.178	368.411	328.816	292.688	391.695	388.462	390.918	395.049	374.403	331.223	443.308	442.740	397.045	442.077	492.875	370.969	336.497	370.224	389.690
Take 10	364.368	371.393	367.899	329.027	301.211	392.037	390.824	391.688	399.051	368.478	326.736	443.421	441.128	388.815	442.914	497.922	369.011	328.950	371.444	386.006
Take 11	363.903	371.438	370.986	327.015	302.588	392.212	390.020	389.635	393.363	370.702	329.149	435.387	444.009	389.206	443.540	495.794	373.941	330.996	375.937	389.381
Take 12	367.109	372.759	369.012	328.807	301.146	399.220	389.749	391.737	399.000	372.261	328.543	444.097	444.622	391.161	441.667	496.005	366.507	334.023	369.215	385.788
Take 13	364.477	366.860	366.861	331.062	291.687	395.472	388.350	393.465	394.000	370.358	332.927	449.898	439.718	394.624	442.952	493.456	361.991	333.338	372.152	385.511
Take 14	363.190	366.179	366.336	326.398	295.710	391.739	389.923	389.858	389.858	366.166	331.442	437.311	439.059	388.763	435.475	485.058	369.199	327.624	369.930	390.033
Take 15	367.656	371.026	365.512	329.861	292.354	401.610	389.383	392.478	393.500	373.605	322.899	443.959	441.182	395.161	440.766	493.490	367.589	333.611	372.280	385.554
Take 16	366.052	370.275	364.200	327.615	290.747	389.247	389.241	394.455	389.003	367.725	325.243	438.148	438.535	390.025	436.701	487.336	368.124	327.594	367.294	384.420
Take 17	368.285	369.390	368.305	326.290	296.863	400.781	389.907	388.836	387.197	370.060	331.849	445.046	438.335	393.519	440.213	493.459	368.245	331.848	368.282	387.102
Take 18	368.042	369.546	371.587	326.682	294.110	394.332	392.223	391.420	388.245	371.996	327.219	438.114	439.404	395.546	438.588	490.262	369.352	332.289	376.847	389.071
Take 19	365.511	367.363	368.035	326.841	296.520	395.857	387.091	391.827	392.367	372.409	325.461	442.981	440.283	389.162	437.738	493.657	373.715	331.016	365.679	387.037
Take 20	357.186	407.125	366.373	327.889	300.859	394.676	389.133	394.190	393.096	371.111	326.183	459.004	440.891	386.771	446.478	490.698	373.522	329.621	366.127	391.169

Take 21	367.643	379.747	369.021	323.938	294.688	391.990	391.113	391.500	395.754	376.838	326.200	436.781	437.629	384.484	440.150	500.277	372.536	331.244	370.424	388.118
Sop 3 AVERAGE	366.576	370.889	368.496	328.742	296.414	393.627	389.607	391.607	393.501	371.319	328.518	442.471	440.552	391.130	440.368	493.148	369.929	331.143	371.440	388.553
Cents RF+3rds	-16.566	3.685	-7.524	-5.156	15.634	6.692	-11.079	-2.213	6.138	5.689	-6.337	9.198	1.672	-4.322	0.949	-3.076	-0.804	7.442	6.253	-15.768
Cents RF-3rds	-12.657	7.594	-3.615	-1.247	19.543	10.601	-7.170	1.695	10.047	9.597	-2.428	13.107	5.581	-0.413	4.858	0.832	3.105	11.351	10.162	-11.859
Just Int I	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Just Int II	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Pythagorean	7.820	7.820	7.820	3.910	0.000	-1.955	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	-1.955	1.955	5.865	7.820	3.910	7.820	-1.955
Meantone	-13.686	-13.686	-13.686	-6.843	0.000	3.422	3.422	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	3.422	-3.421	-10.264	-13.686	-6.843	-13.686	3.422
Take 01	373.763	375.354	371.757	336.811	303.291	395.861	399.596	397.102	397.258	379.207	345.470	444.410	442.828	393.447	440.228	496.279	374.774	334.933	379.409	394.973
Take 02																				
Take 03	366.003	370.430	368.860	330.813	298.110	392.756	395.114	395.935	398.734	374.488	339.019	440.595	442.064	397.214	438.320	498.289	371.984	332.513	370.118	392.352
Take 04	367.663	373.049	365.455	335.778	296.666	388.115	392.367	395.001	394.708	378.955	336.214	446.831	443.982	399.192	445.576	498.671	374.940	332.599	376.144	392.829
Take 05																				
Take 06	365.220	369.301	370.848	321.649	297.183	390.577	390.393	392.513	391.435	373.026	333.314	435.183	439.454	394.442	438.057	497.917	369.459	331.414	372.754	390.853
Take 07	367.828	367.406	364.573	332.865	297.584	389.944	395.729	396.737	397.357	373.599	335.821	434.289	441.633	390.387	440.760	496.653	369.689	331.303	369.196	392.273
Take 08	366.897	366.813	367.134	328.119	298.250	388.959	395.920	393.468	388.101	372.202	333.000	437.517	440.502	394.413	440.814	496.713	370.577	333.617	373.020	392.562
Take 09	368.601	371.297	364.220	328.617	296.071	389.074	394.249	393.871	389.839	373.020	326.768	441.303	442.377	388.456	439.407	497.626	369.932	331.003	368.758	392.558
Take 10	365.667	371.741	370.183	333.980	302.257	388.087	393.323	394.619	395.812	376.055	338.174	441.135	443.064	390.829	442.444	496.347	371.194	334.106	370.417	392.079
Take 11	368.753	370.542	371.056	330.678	302.222	391.660	393.688	396.501	393.932	375.737	333.637	442.891	443.848	397.655	445.859	498.631	368.190	332.837	370.629	393.855
Take 12	366.639	369.734	365.736	329.482	299.346	391.835	393.847	393.866	388.526	373.785	339.767	436.430	439.072	397.881	440.685	495.898	369.359	331.868	371.853	391.480
Take 13	367.381	368.801	367.799	336.373	299.457	390.650	392.084	395.560	389.791	373.632	340.068	439.163	438.328	401.633	442.475	492.097	371.739	334.074	370.854	393.481
Take 14	365.002	363.635	364.695	327.303	296.905	386.037	390.187	388.918	386.688	370.211	332.160	432.809	439.735	394.900	437.872	489.691	366.482	327.446	368.006	389.443
Take 15	364.288	364.957	363.023	325.195	291.590	386.794	388.190	389.278	385.932	366.892	332.180	435.220	437.986	394.653	441.917	492.066	366.826	329.137	368.678	387.886
Take 16	367.801	368.864	363.987	330.095	297.775	388.012	386.819	389.460	387.385	365.794	331.317	434.001	438.211	393.530	440.106	494.389	367.105	331.017	367.467	388.039
Take 17	367.196	367.539	365.533	327.328	296.546	389.262	390.501	389.746	389.807	368.137	328.265	433.998	437.870	397.753	439.832	495.410	367.155	328.787	366.532	387.724
Take 18	366.960	372.833	366.108	329.912	296.073	388.832	390.218	392.998	388.232	371.229	336.724	432.730	436.822	395.489	436.082	494.522	367.266	336.478	371.413	385.777
Take 19	364.128	368.135	361.149	325.739	295.791	385.455	388.054	390.336	388.737	370.136	334.741	437.051	436.460	390.143	436.915	491.209	367.904	334.543	374.003	390.636
Take 20	368.547	399.746	367.222	336.281	297.585	391.204	391.200	391.249	385.646	371.078	334.762	463.885	436.663	401.145	445.428	484.172	396.951	331.302	371.881	389.225
Take 21	367.736	369.224	365.199	328.537	300.708	388.444	396.886	393.970	391.745	369.949	338.435	433.953	435.293	400.518	443.534	499.202	371.042	332.479	373.896	390.542
Sop 4 AVERAGE	367.162	369.425	366.555	330.292	298.074	389.556	392.546	393.217	391.035	372.481	335.254	437.750	439.800	395.457	440.858	495.645	369.757	332.182	371.317	390.977
Cents RF+3rds	-13.803	-3.162	-16.668	2.992	25.306	-11.306	1.931	4.891	-4.744	11.097	28.807	-9.371	-1.286	14.723	2.878	5.667	-1.610	12.867	5.682	-5.000
Cents RF-3rds	-9.894	0.747	-12.759	6.900	29.214	-7.397	5.840	8.800	-0.835	15.006	32.716	-5.462	2.623	18.632	6.786	9.576	2.298	16.776	9.591	-1.091
Just Int I	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Just Int II	-13.686	-13.686	-13.686	3.910	0.000	-1.955	-1.955	-29.219	-29.219	-13.686	3.910	1.955	1.955	-1.955	1.955	5.865	-13.686	3.910	-13.686	-1.955
Pythagorean	7.820	7.820	7.820	3.910	0.000	-1.955	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	-1.955	1.955	5.865	7.820	3.910	7.820	-1.955
Meantone	-13.686	-13.686	-13.686	-6.843	0.000	3.422	3.422	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	3.422	-3.421	-10.264	-13.686	-6.843	-13.686	3.422

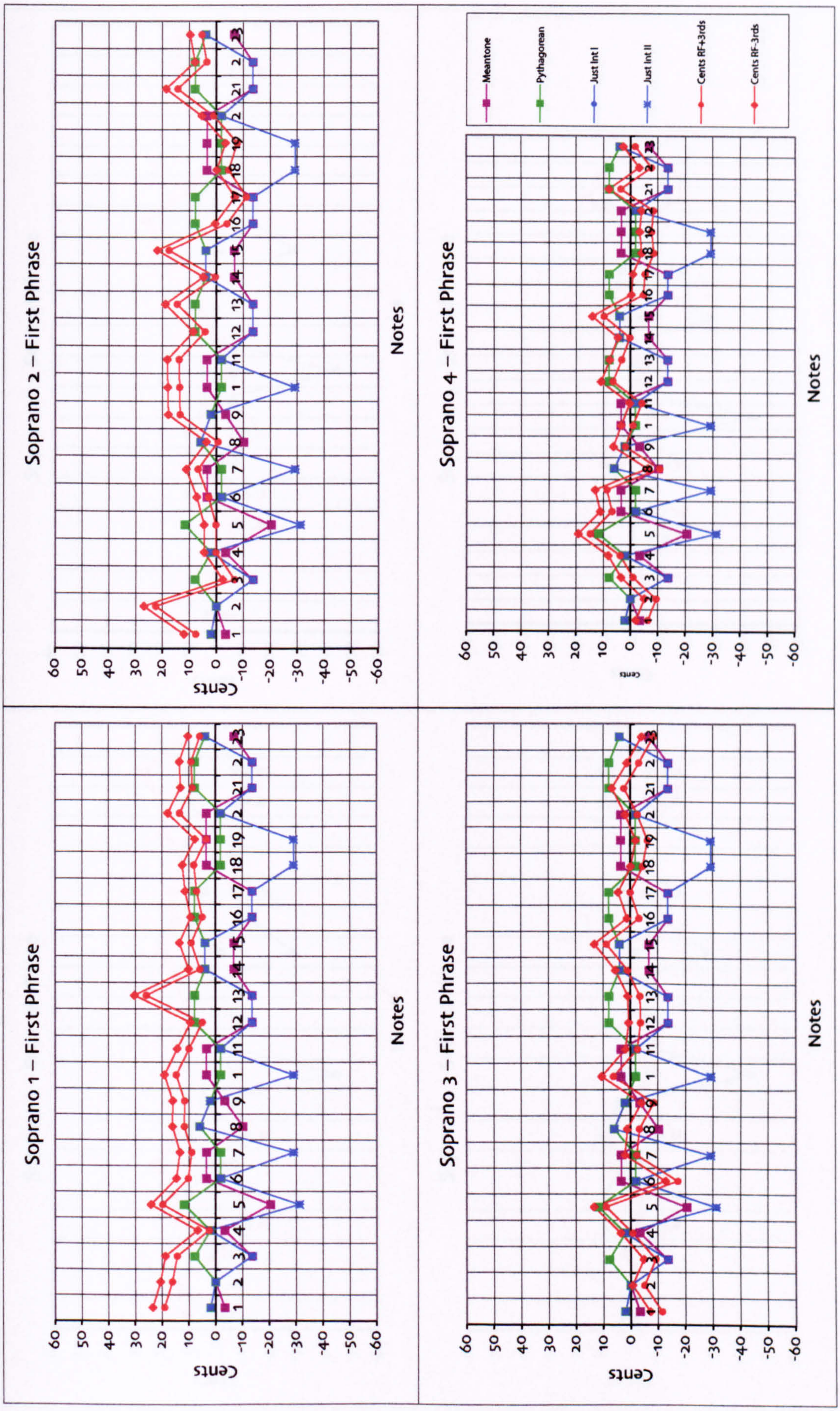
Fifth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16
Take 01	398.817	599.673	634.102	666.836	497.192	560.408	596.268	564.747	496.914	451.129	589.982	401.893	376.509	331.678	329.128	299.002
Take 02																
Take 03	395.324	597.946	630.729	662.270	499.337	559.389	592.643	559.868	496.492	442.758	593.286	398.530	375.719	332.277	329.172	295.204
Take 04	405.780	574.780	611.149	646.638	499.270	564.096	594.715	564.985	504.288	463.795	602.283	395.143	373.716	335.468	334.091	296.801
Take 05																
Take 06	396.128	594.778	631.226	662.495	496.321	562.449	588.048	562.863	497.129	444.831	597.237	396.128	371.923	332.104	332.383	295.982
Take 07	397.112	596.811	625.311	665.341	501.507	561.068	591.013	560.725	496.404	448.569	601.453	392.034	372.296	328.675	330.814	295.452
Take 08	397.510	593.619	630.658	668.562	502.629	561.551	592.193	563.948	503.861	454.316	592.759	401.119	371.409	331.793	336.196	296.990
Take 09	396.971	562.520	626.416	663.022	495.380	563.280	593.213	558.358	488.557	446.765	591.182	386.953	372.991	329.776	333.862	295.064
Take 10	399.119	598.404	626.281	663.758	496.440	561.663	596.471	565.708	499.164	442.094	592.693	397.512	373.364	333.470	333.497	296.680
Take 11	399.698	598.598	631.258	667.802	506.997	564.616	598.995	567.136	500.480	452.239	601.630	402.619	376.723	334.778	335.258	297.576
Take 12	397.663	598.003	632.897	669.028	500.235	561.449	597.164	562.555	495.098	447.236	603.066	396.182	372.763	332.008	335.676	297.250
Take 13	398.946	598.135	629.620	664.956	499.761	554.400	600.989	564.864	500.400	445.535	604.373	393.985	372.536	332.572	331.155	297.066
Take 14	396.712	591.626	625.409	651.026	493.540	554.240	590.255	559.431	496.021	444.418	588.371	394.105	370.975	326.718	330.703	293.844
Take 15	395.832	593.295	624.623	662.993	498.571	558.845	593.520	558.392	496.715	443.544	597.271	391.121	367.597	329.817	329.965	295.236
Take 16	393.637	591.152	629.378	669.203	498.657	563.178	587.626	561.265	500.972	450.386	596.471	390.552	371.050	332.111	333.051	292.360

Take 17	395.207	593.118	622.538	662.995	505.056	565.822	593.203	563.261	502.420	449.583	595.193	392.717	370.767	327.600	328.921	291.889
Take 18	394.858	594.944	625.833	662.712	491.355	560.793	589.284	563.991	499.067	450.398	589.363	398.280	373.381	344.056	333.768	294.887
Take 19	397.896	593.199	631.962	668.589	504.042	557.656	598.942	566.502	497.850	444.172	594.978	394.484	371.102	330.783	330.834	292.114
Take 20	400.587	596.101	631.378	667.842	489.665	565.425	596.653	561.069	500.077	451.206	604.784	395.321	370.875	327.601	339.292	293.613
Take 21	398.706	598.172	636.292	661.230	497.054	553.851	592.697	569.709	498.330	451.367	599.448	403.149	371.328	330.201	332.313	292.524
Sop 1 AVERAGE	397.711	595.740	629.217	664.481	498.580	560.746	593.889	563.125	498.434	447.808	596.622	395.886	372.475	331.079	332.636	293.285
Cents RF+3rds	20.973	20.527	15.179	9.583	12.297	15.727	15.141	23.056	11.791	26.366	23.091	13.009	7.482	3.522	11.641	-6.330
Cents RF-3rds	21.458	21.012	15.664	10.068	12.782	16.212	15.626	23.540	12.276	26.851	23.575	13.494	7.966	4.007	12.126	-5.845
Just Int I	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Just Int II	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Pythagorean	-1.955	0.000	13.685	3.910	5.865	9.775	0.000	9.775	5.865	1.955	0.000	-1.955	7.820	3.910	3.910	0.000
Meantone	3.422	0.000	-23.951	-6.843	-10.264	-17.108	0.000	-17.108	-10.264	-3.421	0.000	3.422	-13.686	-6.843	-6.843	0.000
Take 01	396.984	595.194	626.374	672.880	501.569	563.943	595.747	566.467	495.279	436.800	595.350	399.230	372.493	331.291	337.003	297.897
Take 02																
Take 03	393.281	590.404	622.601	657.095	499.945	559.972	593.464	561.713	498.413	441.963	591.871	390.618	369.726	328.448	332.303	294.419
Take 04	393.671	478.769	565.787	641.831	501.303	559.501	599.232	562.686	499.097	441.077	602.792	392.955	371.750	330.012	332.788	297.341
Take 05																
Take 06	401.541	586.696	612.285	632.582	492.021	524.769	584.481	559.755	496.598	439.812	568.365	395.451	370.918	330.129	330.420	295.416
Take 07	396.099	589.456	619.998	627.014	493.776	556.055	592.148	563.610	498.433	440.618	588.357	396.967	369.556	328.648	332.024	294.636
Take 08	394.056	575.770	627.722	660.566	498.368	557.848	591.145	558.319	497.350	439.262	597.012	392.940	369.896	331.123	333.986	296.768
Take 09	394.628	541.812	626.881	649.295	492.862	567.740	596.515	560.557	489.758	436.518	596.775	392.125	367.257	328.898	332.450	295.616
Take 10	395.886	593.467	626.788	540.121	494.866	559.873	369.966	567.568	498.162	443.447	567.346	395.086	374.357	330.962	336.014	295.334
Take 11	398.744	599.486	630.743	620.944	494.645	563.375	595.531	547.155	497.107	447.277	595.946	396.011	374.557	332.917	335.654	297.078
Take 12	394.398	594.307	627.427	663.180	493.208	559.239	593.819	570.225	488.709	442.094	604.450	389.494	371.251	330.335	334.366	296.284
Take 13	393.855	594.978	628.264	659.219	494.697	550.930	560.593	556.553	495.941	446.174	589.859	396.595	369.488	330.421	332.693	295.890
Take 14	393.941	588.136	474.522	658.053	484.835	573.970	585.398	560.475	496.472	442.040	592.604	388.391	371.063	328.852	328.341	298.904
Take 15	392.776	587.235	610.916	621.927	490.262	558.830	580.407	564.731	490.180	435.005	579.782	390.886	367.399	328.032	328.868	291.978
Take 16	393.316	588.944	615.463	569.612	492.935	554.434	589.989	559.377	498.256	439.869	594.440	391.599	369.465	328.602	330.320	292.924
Take 17	393.821	593.501	616.135	624.057	489.714	517.144	596.020	475.339	484.865	431.243	601.754	390.712	365.992	327.613	328.950	291.424
Take 18	393.768	564.582	624.375	665.184	490.254	554.871	554.482	558.311	500.688	443.566	602.707	391.156	368.803	330.705	331.672	292.694
Take 19	393.108	511.283	623.282	664.693	492.737	556.945	455.393	554.874	492.925	442.610	589.925	395.881	369.073	327.679	330.172	293.342
Take 20	395.685	592.442	623.981	663.428	486.430	555.540	593.669	561.186	502.791	440.969	603.084	396.165	371.896	331.650	331.253	293.853
Take 21	396.913	530.027	626.496	668.238	492.094	562.140	551.938	559.271	500.221	439.377	556.904	396.964	373.187	330.705	331.190	294.857
Sop 2 AVERAGE	395.077	590.715	622.925	661.985	493.501	559.718	591.969	561.510	495.855	440.512	596.462	393.644	370.428	329.843	332.130	293.686
Cents RF+3rds	9.472	5.865	-2.220	3.066	-5.427	12.549	9.535	18.084	2.812	-2.074	22.625	3.177	-2.061	-2.954	9.006	-3.959
Cents RF-3rds	9.957	6.350	-1.735	3.551	-4.942	13.034	10.020	18.569	3.296	-1.590	23.110	3.662	-1.576	-2.469	9.491	-3.474
Just Int I	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Just Int II	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Pythagorean	-1.955	0.000	13.685	3.910	5.865	9.775	0.000	9.775	5.865	1.955	0.000	-1.955	7.820	3.910	3.910	0.000
Meantone	3.422	0.000	-23.951	-6.843	-10.264	-17.108	0.000	-17.108	-10.264	-3.421	0.000	3.422	-13.686	-6.843	-6.843	0.000
Take 01	397.567	591.598	623.612	666.282	504.388	560.008	589.413	559.337	499.311	434.445	590.171	390.418	369.004	326.323	328.830	297.182
Take 02																
Take 03	393.306	594.222	622.563	659.936	488.260	566.752	588.899	556.092	492.870	433.227	587.554	391.602	367.606	328.870	328.927	0.000
Take 04	397.116	592.335	627.532	664.513	503.261	558.343	588.132	556.102	492.890	443.672	589.381	393.405	371.338	329.940	330.786	293.943
Take 05																
Take 06	399.190	593.119	622.094	651.289	498.874	562.324	586.028	552.166	499.070	442.974	591.281	388.094	371.420	328.627	331.407	295.541
Take 07	396.191	592.574	622.385	656.256	502.118	562.046	587.373	556.923	494.677	436.241	591.518	397.132	369.512	329.304	331.393	296.007
Take 08	397.044	593.022	626.967	658.700	503.705	554.688	586.007	557.929	497.690	442.081	587.729	389.746	372.337	327.166	332.117	295.428
Take 09	399.433	593.209	630.083	648.228	493.920	555.131	584.556	559.950	496.177	441.000	591.790	391.275	367.261	326.989	331.183	295.049
Take 10	396.870	590.419	622.983	651.588	497.977	557.853	583.007	559.307	497.499	438.996	588.349	398.772	366.454	327.422	329.252	294.332
Take 11	399.379	592.143	627.819	659.505	500.016	555.913	586.437	553.564	494.346	438.079	590.406	390.984	368.847	332.088	331.518	295.577
Take 12	396.166	592.211	625.370	662.800	503.532	559.421	591.226	550.464	496.118	439.637	595.845	392.835	368.607	330.383	331.822	298.576
Take 13	400.187	592.442	624.223	664.754	497.881	553.443	582.713	551.453	496.600	448.887	585.614	389.766	369.477	328.457	325.942	295.058
Take 14	393.241	585.594	614.779	655.883	495.629	554.193	584.639	553.885	495.790	436.426	587.288	386.587	368.378	324.550	325.704	291.841

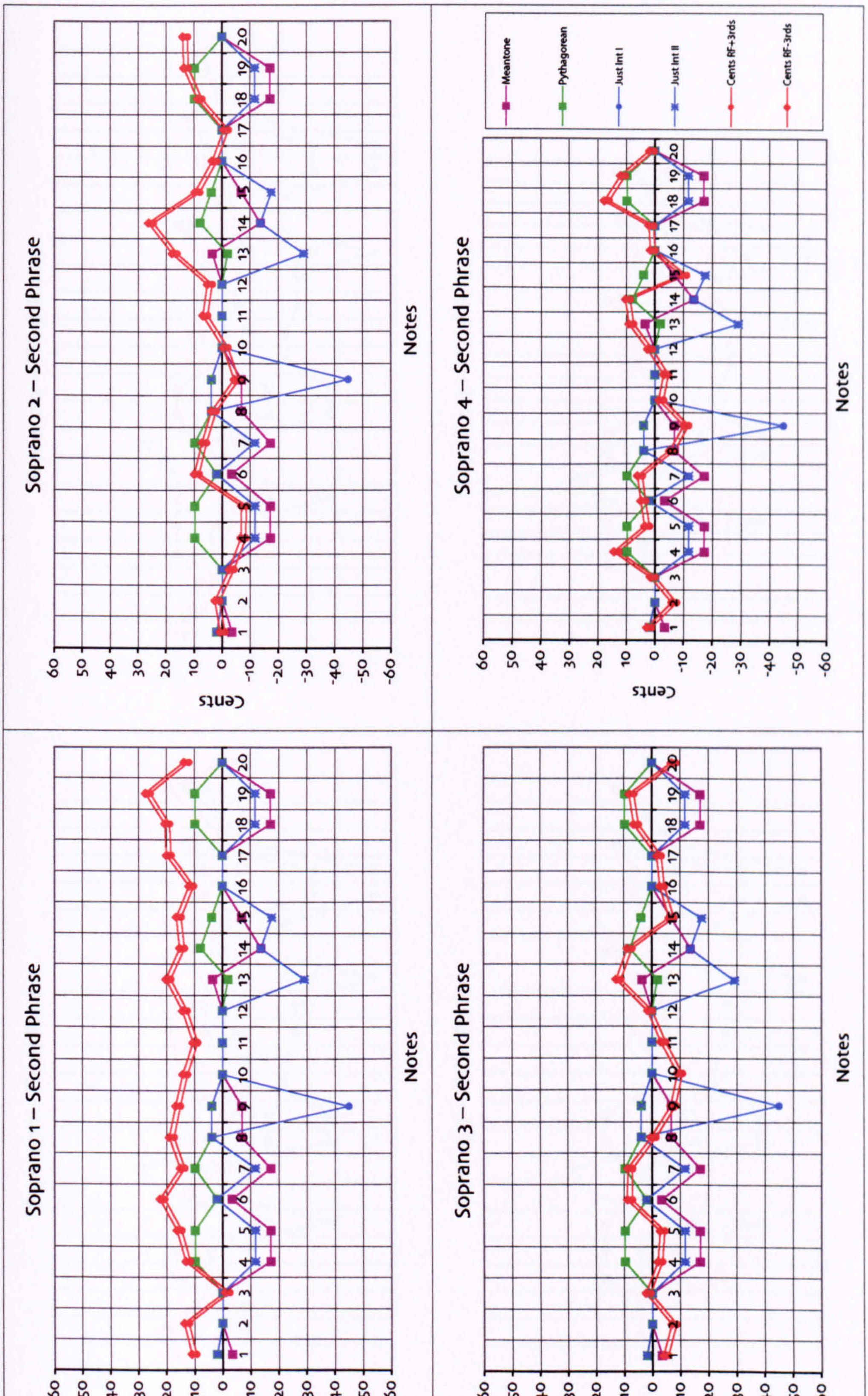
Take 15	392.256	588.929	620.651	655.277	498.290	556.348	589.828	560.295	495.607	442.091	595.030	387.706	367.067	326.930	328.715	292.635
Take 16	392.625	588.053	619.864	658.542	498.987	560.035	585.084	555.222	496.746	440.559	587.166	387.324	369.413	326.453	324.690	295.672
Take 17	393.341	588.181	615.927	650.719	497.679	545.310	588.033	552.993	490.687	437.974	587.065	388.512	367.250	326.820	322.853	292.470
Take 18	393.338	584.978	614.714	643.422	497.360	553.595	582.651	557.522	498.573	446.907	584.956	384.242	367.256	326.364	332.719	293.895
Take 19	393.823	587.930	618.235	651.703	496.400	557.042	582.907	554.533	492.526	440.894	585.845	389.740	368.014	326.227	323.648	293.940
Take 20	392.224	587.534	619.929	646.280	493.811	557.064	582.092	556.688	498.115	449.095	583.281	388.001	370.972	328.319	326.110	292.020
Take 21	394.582	588.646	610.059	653.744	501.806	558.453	581.912	555.546	490.000	441.266	579.264	397.425	368.135	325.906	327.951	292.922
Sop 3 AVERAGE	**395.678**	**590.376**	**621.568**	**655.759**	**498.626**	**557.261**	**585.839**	**555.788**	**495.542**	**440.761**	**588.397**	**390.714**	**368.860**	**327.744**	**328.714**	**294.560**
Cents RF+3rds	12.100	4.869	-5.997	-13.292	12.459	4.934	-8.487	0.350	1.717	-1.097	-0.945	-9.755	-9.401	-14.007	-8.891	1.185
Cents RF-3rds	12.585	5.354	-5.512	-12.807	12.944	5.418	-8.002	0.835	2.202	-0.612	-0.460	-9.270	-8.916	-13.522	-8.406	1.670
Just Int I	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Just Int II	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Pythagorean	-1.955	0.000	13.685	3.910	5.865	9.775	0.000	9.775	5.865	1.955	0.000	-1.955	7.820	3.910	3.910	0.000
Meantone	3.422	0.000	-23.951	-6.843	-10.264	-17.108	0.000	-17.108	-10.264	-3.421	0.000	3.422	-13.686	-6.843	-6.843	0.000
Take 01	398.327	597.100	616.336	680.760	501.959	563.558	589.177	561.323	498.167	447.628	588.430	391.929	369.949	331.072	331.148	296.600
Take 02																
Take 03	396.094	588.761	622.074	658.610	494.882	558.103	582.895	556.059	494.760	439.913	584.634	393.478	369.001	328.240	331.628	293.787
Take 04	395.925	583.686	623.382	662.906	493.824	561.585	592.703	562.744	496.774	437.500	593.758	391.139	370.414	333.442	330.201	296.870
Take 05																
Take 06	396.823	593.057	615.449	647.151	497.187	557.970	590.743	559.394	494.330	437.641	589.345	389.737	371.036	329.349	331.045	292.979
Take 07	397.087	588.418	617.510	651.105	497.541	561.405	588.274	555.253	497.270	436.770	585.794	387.670	368.836	330.055	328.412	293.528
Take 08	394.056	589.415	622.340	642.991	492.737	561.355	589.398	560.749	495.612	436.814	585.214	391.020	369.137	330.280	330.281	299.532
Take 09	393.625	589.839	620.197	654.864	495.506	559.830	586.347	555.656	483.671	433.474	583.454	390.159	369.131	332.794	328.654	298.411
Take 10	394.553	592.501	600.136	654.969	490.936	558.733	579.473	563.141	493.352	438.614	587.639	391.613	372.374	331.160	327.753	299.592
Take 11	396.714	593.763	604.626	668.924	492.311	558.596	590.277	554.972	494.804	445.271	591.582	395.363	371.919	332.283	330.542	296.205
Take 12	393.077	591.895	622.588	654.893	495.034	557.617	579.954	553.617	497.246	432.869	587.949	390.595	371.305	332.049	327.030	294.073
Take 13	392.150	590.971	624.289	638.093	490.778	559.510	588.679	557.528	497.297	439.583	585.614	393.775	370.976	328.501	327.411	295.687
Take 14	393.106	585.337	611.975	651.407	486.804	555.787	579.585	551.806	485.658	432.226	576.033	386.383	367.080	328.567	320.458	296.641
Take 15	393.534	588.129	616.405	655.704	485.011	558.649	588.151	560.635	488.935	437.291	575.153	387.108	368.987	330.058	322.770	295.563
Take 16	394.242	589.371	610.379	652.847	491.575	566.470	584.847	556.805	493.110	434.545	571.766	391.947	368.272	329.953	328.855	292.029
Take 17	391.974	586.712	611.085	647.616	488.481	551.396	585.978	557.606	491.267	434.133	586.939	389.156	369.215	327.692	325.390	292.049
Take 18	392.564	586.596	609.678	648.529	494.603	553.078	581.212	552.290	488.044	434.603	563.016	388.311	368.545	326.658	329.042	293.598
Take 19	393.142	587.117	613.028	651.207	486.945	555.551	580.419	549.282	493.229	432.633	589.572	389.484	365.679	326.151	327.695	293.254
Take 20	394.960	586.425	613.581	658.292	490.813	554.436	581.826	549.763	488.151	442.459	592.691	395.283	368.453	329.389	326.987	298.719
Take 21	394.744	590.140	615.371	649.760	491.779	556.813	584.152	552.247	489.206	439.384	588.914	394.623	375.373	341.229	326.453	297.458
Sop 4 AVERAGE	**394.563**	**589.433**	**616.804**	**655.141**	**492.563**	**558.444**	**585.478**	**556.362**	**492.678**	**437.545**	**585.650**	**390.988**	**369.773**	**329.872**	**327.987**	**295.757**
Cents RF+3rds	7.216	2.103	-19.317	-14.925	-8.719	8.605	-9.552	2.137	-8.317	-13.774	-9.044	-8.541	-5.124	-2.804	-12.724	8.205
Cents RF-3rds	7.701	2.588	-18.832	-14.440	-8.234	9.090	-9.067	2.621	-7.832	-13.289	-8.559	-8.057	-4.639	-2.319	-12.239	8.690
Just Int I	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Just Int II	-1.955	0.000	-7.821	3.910	5.865	-11.731	-27.264	-11.731	-15.641	1.955	0.000	-1.955	-13.686	3.910	3.910	0.000
Pythagorean	-1.955	0.000	13.685	3.910	5.865	9.775	0.000	9.775	5.865	1.955	0.000	-1.955	7.820	3.910	3.910	0.000
Meantone	3.422	0.000	-23.951	-6.843	-10.264	-17.108	0.000	-17.108	-10.264	-3.421	0.000	3.422	-13.686	-6.843	-6.843	0.000

11.4 - THE BBC SINGERS SOPRANOS' RESULTS



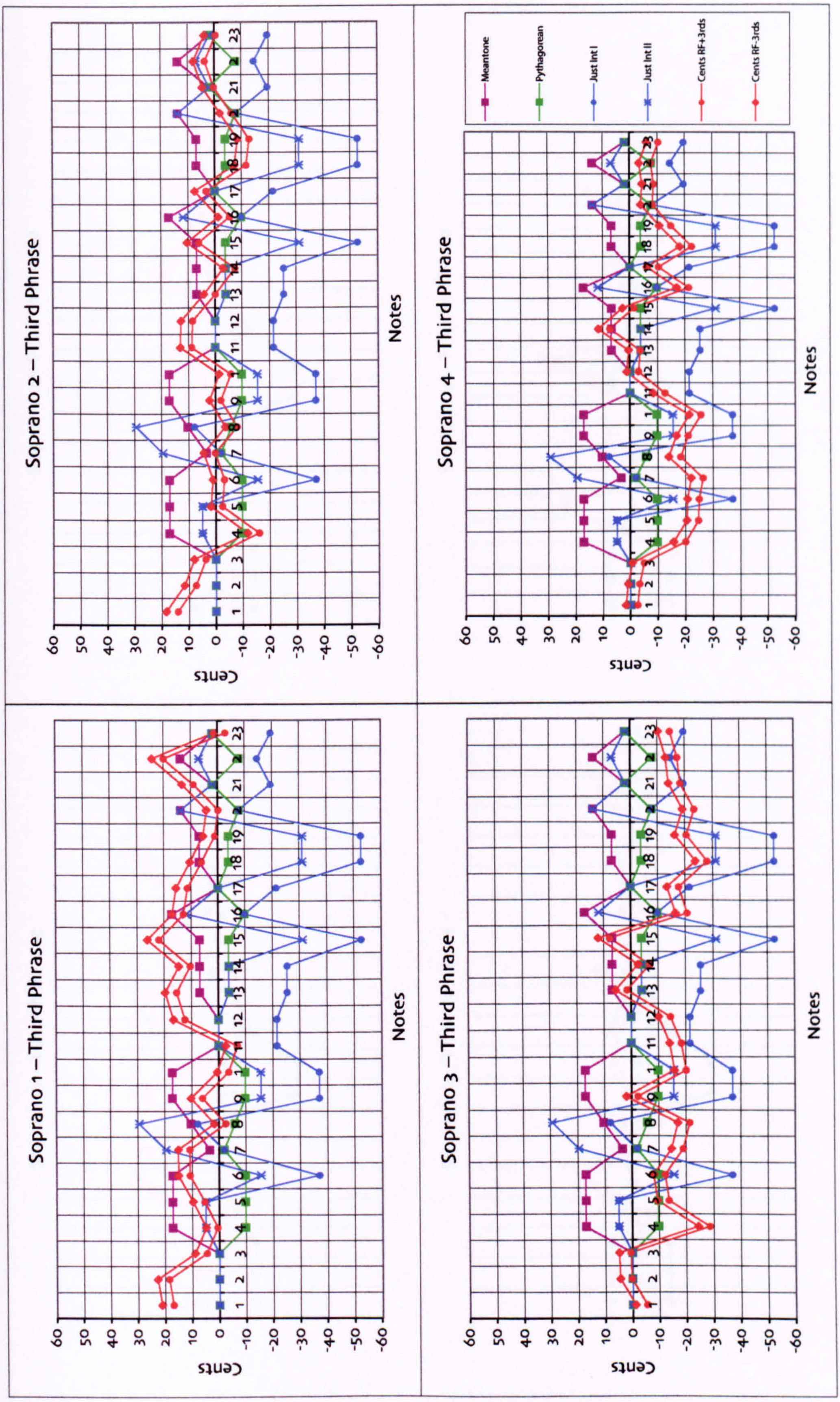
11.4A - THE BBC SINGERS SOPRANOS' CHARTS – PHRASE 1

11.4A - THE BBC SINGERS SOPRANOS' CHARTS – PHRASE 1



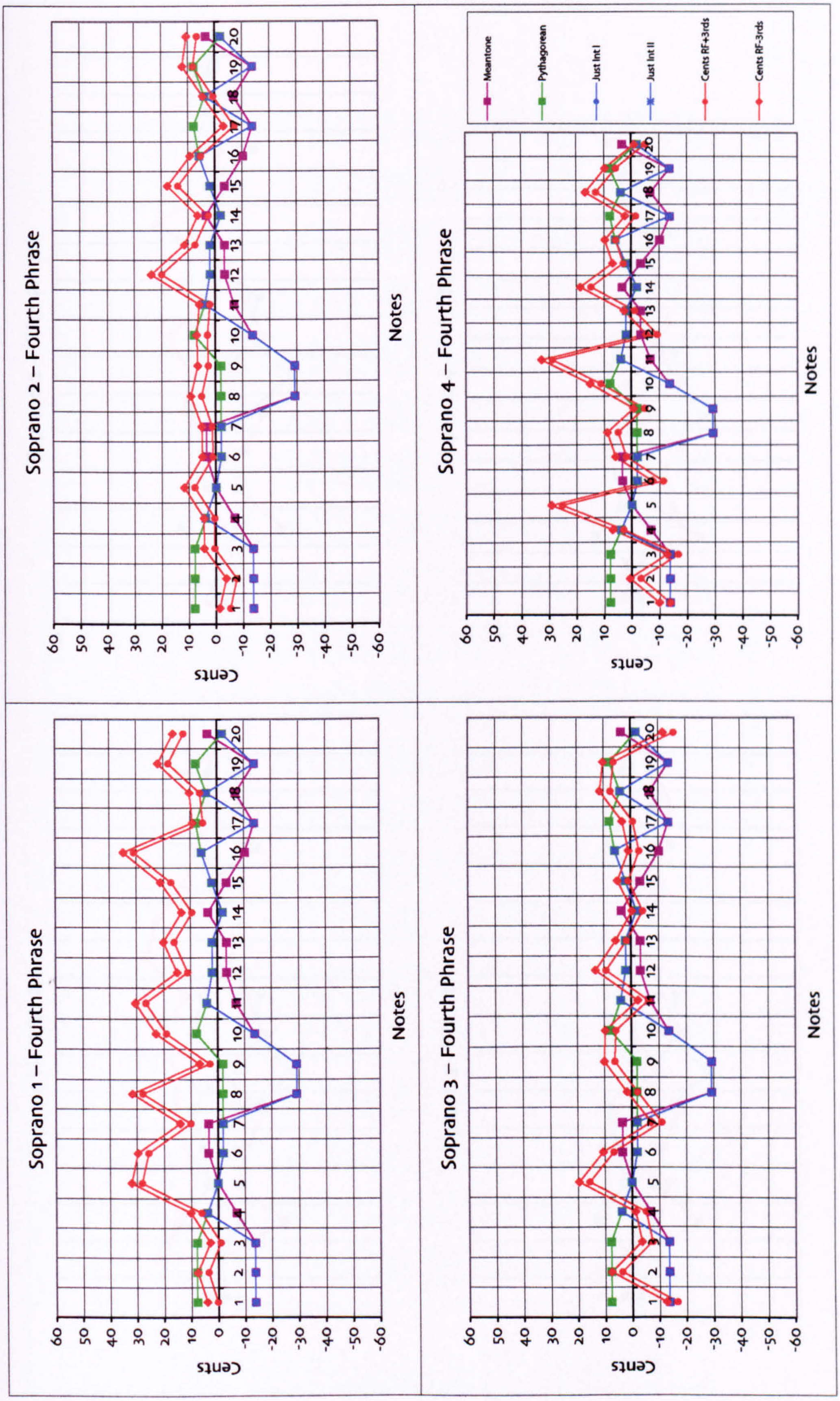
11.4B - THE BBC SINGERS SOPRANOS' CHARTS – PHRASE 2

11.4B - THE BBC SINGERS SOPRANOS' CHARTS – PHRASE 2



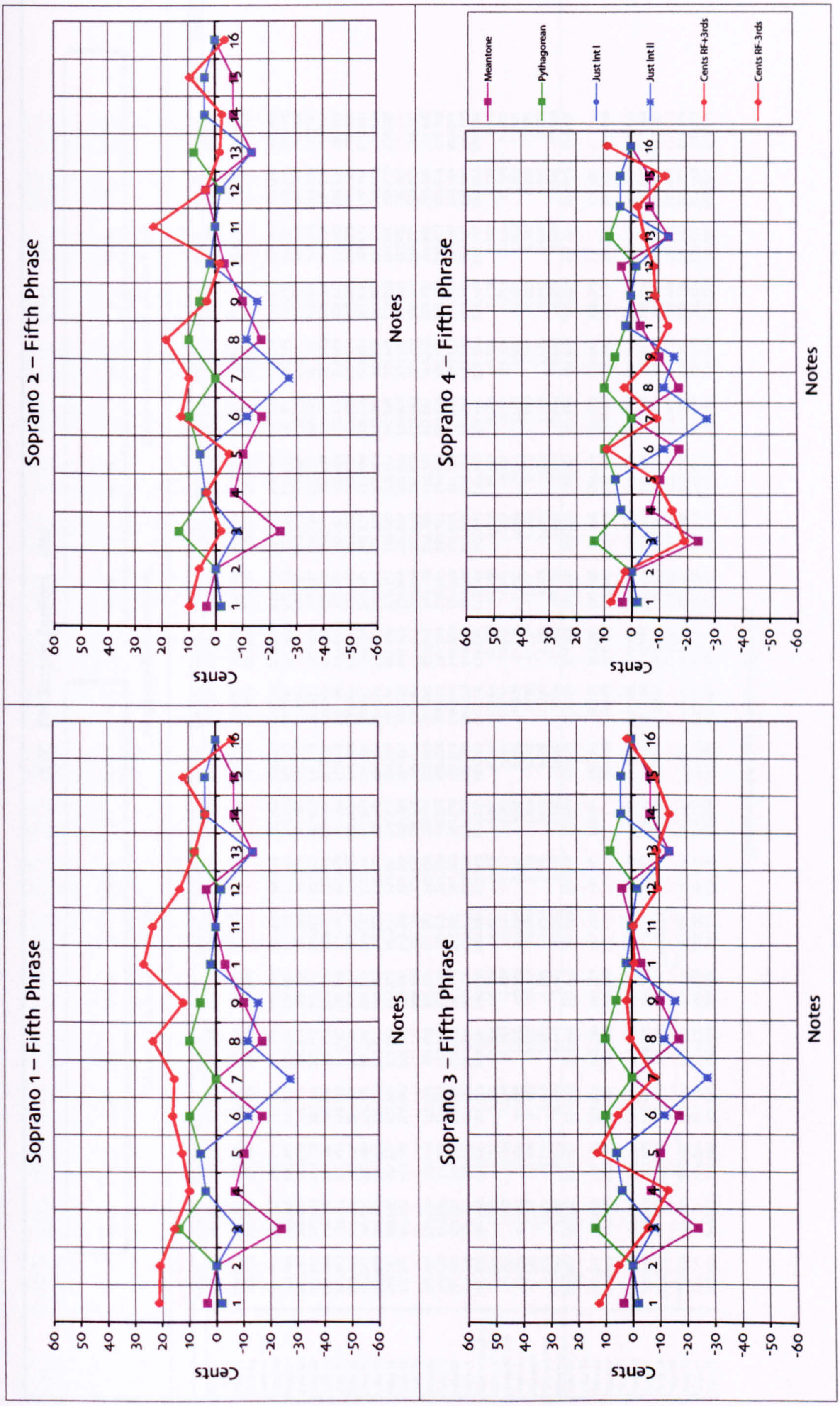
11.4c - The BBC Singers sopranos' charts – Phrase 3

11.4c - The BBC Singers sopranos' charts – Phrase 3



11.4D - THE BBC SINGERS SOPRANOS' CHARTS – PHRASE 4

11.4D - THE BBC SINGERS SOPRANOS' CHARTS – PHRASE 4



11.4E - THE BBC SINGERS SOPRANOS' CHARTS – PHRASE 5

11.4E - THE BBC SINGERS SOPRANOS' CHARTS – PHRASE 5

AVC _ BBC Singers Sections _ Alto

Reference Frequencies with Thirds										
Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
147.030	D	110.057	A	110.428	A	146.875	D	147.179	D

Reference Frequencies without Thirds									
Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
146.658	D	109.949	A	110.156	A	146.543	D	147.138	D

Frequency Measurements

First Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
Take 01	368.499	367.648	325.870	326.475	329.060	394.468	368.194	329.210	328.339	290.191	295.963	278.314	279.143	291.198	297.145	326.727	325.674	327.325	291.399	295.542	277.584		
Take 02																							
Take 03	368.748	372.493	329.373	335.298	327.637	383.881	367.910	327.506	328.194	288.235	295.588	277.328	280.005	289.536	295.907	328.514	325.981	329.200	295.924	297.791	279.295		
Take 04	368.176	369.376	326.787	327.148	326.512	394.698	367.991	322.637	325.797	294.511	297.826	280.398	276.222	297.365	294.802	326.002	331.018	329.172	305.453	296.606	279.885		
Take 05																							
Take 06	367.150	369.237	330.420	331.261	333.553	388.205	366.880	329.283	330.720	303.537	297.114	278.237	275.843	291.635	299.459	327.171	327.055	327.468	289.160	293.603	281.463		
Take 07	369.090	369.980	332.622	329.227	327.201	385.996	373.353	330.908	323.128	290.711	297.697	277.440	276.535	290.684	295.018	334.937	331.278	333.336	290.920	298.924	279.740		
Take 08	371.195	369.347	334.232	333.476	330.544	388.444	374.996	333.912	331.065	293.205	296.544	281.017	279.100	294.196	295.434	333.529	328.352	332.224	297.649	297.116	279.406		
Take 09	372.421	367.689	334.183	330.123	329.118	392.017	375.605	331.053	327.007	291.119	298.586	281.024	280.747	296.089	295.393	326.251	331.592	330.996	295.474	294.309	278.737		
Take 10	367.264	368.163	331.327	335.861	332.128	388.614	369.722	328.072	324.733	295.312	296.529	280.099	279.708	296.115	293.868	325.242	323.908	329.596	294.209	297.614	280.665		
Take 11	375.993	373.423	336.413	333.166	329.653	390.303	375.043	331.679	331.332	293.179	292.799	281.450	287.497	297.065	300.459	333.131	334.676	333.317	294.102	296.684	280.947		
Take 12	363.843	369.570	327.494	325.326	327.685	394.051	375.352	324.376	325.237	293.166	295.630	278.904	279.238	294.945	299.226	329.856	331.974	328.809	298.636	297.129	280.035		
Take 13	370.017	367.040	332.164	328.183	330.593	391.822	369.791	330.666	331.674	295.789	299.962	279.337	277.021	292.950	295.299	328.068	326.892	331.953	296.631	297.441	279.081		
Take 14	366.679	368.111	334.803	332.824	331.245	385.386	368.625	333.073	327.484	294.936	291.759	278.124	279.205	291.311	295.205	333.081	323.502	330.037	297.374	298.440	276.659		
Take 15	370.250	368.626	327.677	327.940	322.012	390.635	370.035	324.427	326.175	294.127	293.193	280.467	275.881	293.860	298.155	327.666	323.640	329.099	293.062	294.610	277.580		
Take 16	371.327	371.780	331.784	326.605	326.589	389.038	370.908	327.232	330.448	294.644	298.829	280.962	280.824	297.051	296.890	328.809	320.352	329.524	297.730	299.070	277.244		
Take 17	374.060	372.716	333.499	327.443	333.239	396.068	366.011	328.570	328.660	289.061	293.154	275.681	276.843	295.228	292.819	329.368	329.280	330.146	288.637	293.547	276.152		
Take 18	367.385	370.567	328.754	323.838	325.426	395.834	371.997	330.009	330.053	297.840	295.495	278.641	275.736	295.506	290.565	327.061	317.555	326.223	290.886	293.990	276.695		
Take 19	370.294	367.338	331.408	325.971	330.436	388.385	372.329	330.649	329.237	296.008	296.675	281.331	279.959	298.292	294.818	320.479	320.596	324.890	293.023	294.506	278.328		
Take 20	371.183	371.595	327.946	326.254	329.939	384.668	367.859	327.505	323.279	291.372	296.885	278.829	284.549	290.613	291.523	327.082	324.159	328.361	297.267	295.434	280.341		
Take 21	372.402	372.350	329.933	331.602	329.074	392.401	372.634	329.269	334.016	293.367	298.566	278.659	280.849	291.840	298.251	327.254	323.349	328.190	293.455	297.251	276.720		
Alto 1 AVERAGE	**369.788**	**369.845**	**330.878**	**329.370**	**329.034**	**390.259**	**370.802**	**328.949**	**328.241**	**293.701**	**296.252**	**279.276**	**279.206**	**293.973**	**295.802**	**328.433**	**326.360**	**329.467**	**294.197**	**296.295**	**278.766**		
Cents RF+3rds	-3.288	-3.024	4.234	-3.679	-5.444	-10.010	1.451	-5.889	-9.621	-2.112	12.865	10.702	10.266	-0.509	10.230	-8.608	-19.572	-3.168	0.809	13.114	7.539		
Cents RF-3rds	1.088	1.352	8.610	0.698	-1.068	-5.634	5.827	-1.513	-5.245	2.264	17.241	15.078	14.642	3.867	14.607	-4.232	-15.196	1.208	5.185	17.490	11.915		
Just Int I	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731		
Just Int II	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731		
Pythagorean	7.820	7.820	3.910	3.910	3.910	-1.955	7.820	3.910	3.910	0.000	0.000	9.775	9.775	0.000	0.000	3.910	3.910	3.910	0.000	0.000	9.775		
Meantone	-13.686	-13.686	-6.843	-6.843	-6.843	3.422	-13.686	-6.843	-6.843	0.000	0.000	-17.108	-17.108	0.000	0.000	-6.843	-6.843	-6.843	0.000	0.000	-17.108		
Take 01	366.907	362.187	313.879	324.059	328.930	387.547	367.988	328.783	332.084	295.612	285.460	271.628	277.980	290.780	292.629	331.559	327.654	329.021	297.706	297.959	274.307		
Take 02																							
Take 03	370.627	370.054	327.173	327.922	325.790	384.277	367.789	327.041	328.695	295.885	293.711	272.560	275.482	291.800	291.842	331.072	324.819	330.570	297.677	296.307	272.345		
Take 04	370.665	372.283	329.001	330.131	331.607	399.046	372.626	334.898	332.651	297.735	289.033	278.420	278.645	294.000	292.196	329.348	328.691	331.317	298.296	293.338	274.468		
Take 05																							
Take 06	369.240	366.764	326.761	332.756	333.254	385.783	367.398	330.219	331.286	294.371	290.356	273.522	280.608	290.006	292.881	329.974	327.750	332.272	297.417	292.737	275.421		
Take 07	367.960	366.854	325.379	330.425	328.052	388.519	374.131	333.893	329.317	294.424	291.440	276.379	280.598	295.250	293.834	331.291	328.917	329.534	294.319	297.543	277.108		
Take 08	370.225	371.826	331.176	331.046	332.436	395.527	369.393	329.084	331.462	293.664	296.034	277.855	276.739	292.216	293.389	332.152	330.478	330.283	296.347	298.574	277.426		
Take 09	376.154	374.094	0.000	332.601	332.507	390.265	378.590	330.148	335.538	297.152	295.189	274.691	279.302	294.336	298.650	332.489	326.992	330.499	296.848	297.973	276.018		
Take 10	366.470	366.787	331.027	326.821	333.467	387.732	365.047	326.334	330.661	294.069	290.454	271.725	275.122	291.541	293.129	329.012	328.341	328.297	291.182	295.403	274.278		
Take 11	368.776	372.388	330.225	327.777	329.396	386.689	370.963	331.415	328.757	293.458	296.789	274.147	274.636	293.557	292.074	332.682	330.870	330.513	296.622	295.664	276.963		
Take 12	367.401	365.957	325.600	321.803	330.474	387.253	368.811	331.184	328.614	295.400	289.980	275.577	275.408	292.420	292.773	328.165	326.925	330.234	295.881	296.521	275.335		

Take 13	372.740	367.004	330.640	330.539	331.841	393.937	371.155	324.790	328.319	293.885	287.831	276.125	278.937	291.663	295.185	331.327	331.579	329.375	297.303	295.800	273.532
Take 14	367.035	365.697	331.624	331.228	328.500	387.719	372.115	335.830	328.629	293.937	294.763	276.210	277.142	293.404	293.967	327.981	328.906	331.127	297.935	296.387	276.357
Take 15	367.983	363.771	328.512	328.394	327.980	388.546	365.284	324.059	328.988	289.071	290.456	275.486	278.791	297.515	291.509	328.783	327.338	330.998	296.663	293.764	277.299
Take 16	370.651	369.808	330.282	328.193	331.861	393.532	374.619	327.662	328.824	292.364	289.415	275.689	278.993	291.938	292.800	329.994	326.667	328.569	293.663	292.445	276.618
Take 17	370.250	367.189	330.270	329.728	327.309	395.889	373.653	331.403	329.117	292.128	293.543	273.052	273.412	294.631	292.858	332.529	328.382	331.216	293.586	293.927	274.920
Take 18	368.643	367.636	327.492	327.920	324.437	384.555	369.449	326.461	327.996	291.007	289.668	269.634	271.594	290.897	293.901	324.469	327.231	327.056	295.156	299.499	275.369
Take 19	371.813	370.551	326.611	325.295	328.641	389.850	369.617	328.871	327.506	291.403	294.330	273.420	272.418	291.399	294.976	327.847	325.774	327.946	293.304	296.762	276.370
Take 20	367.065	365.553	329.659	326.221	328.934	387.313	366.027	325.284	321.839	291.589	289.022	272.543	278.419	286.937	292.738	330.181	331.225	329.726	294.659	292.804	273.189
Take 21	366.813	365.198	328.839	326.279	325.559	389.696	368.512	327.727	329.144	292.957	290.112	273.200	274.106	293.591	293.311	327.578	329.025	326.512	294.000	294.659	271.456
Alto 2 AVERAGE	**369.338**	**367.979**	**328.008**	**328.376**	**329.525**	**389.667**	**369.699**	**329.215**	**329.443**	**293.690**	**291.452**	**274.309**	**276.754**	**292.520**	**293.402**	**329.918**	**328.293**	**329.740**	**295.714**	**295.688**	**275.199**
Cents RF+3rds	-5.399	-11.779	-10.848	-8.911	-2.861	-12.636	-3.707	-4.491	-3.290	-2.174	-15.418	-20.368	-5.000	-9.084	-3.871	-0.801	-9.347	-1.731	9.716	9.562	-14.758
Cents RF-3rds	-1.022	-7.403	-6.472	-4.535	1.515	-8.260	0.669	-0.115	1.086	2.202	-11.042	-15.992	-0.624	-4.708	0.505	3.575	-4.971	2.645	14.092	13.938	-10.382
Just Int I	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731
Just Int II	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731
Pythagorean	7.820	7.820	3.910	3.910	3.910	-1.955	7.820	3.910	3.910	0.000	0.000	9.775	9.775	0.000	0.000	3.910	3.910	3.910	0.000	0.000	9.775
Meantone	-13.686	-13.686	-6.843	-6.843	-6.843	3.422	-13.686	-6.843	-6.843	0.000	0.000	-17.108	-17.108	0.000	0.000	-6.843	-6.843	-6.843	0.000	0.000	-17.108
Take 01	371.993	373.474	330.351	329.604	331.146	396.750	372.263	331.732	330.681	294.194	292.169	277.583	277.556	295.879	290.023	332.009	329.089	336.147	296.330	293.542	277.831
Take 02																					
Take 03	365.317	370.045	332.872	331.090	329.807	393.244	372.243	330.023	332.240	291.777	292.577	276.923	276.666	290.564	291.264	329.317	329.188	330.213	293.533	295.384	277.310
Take 04	373.112	369.264	327.128	330.645	332.282	393.922	372.719	332.651	330.238	296.918	297.813	278.771	280.486	293.953	292.001	332.009	331.921	332.794	297.209	297.391	280.082
Take 05																					
Take 06	378.270	375.743	328.879	330.572	330.195	397.617	373.124	334.559	334.818	298.106	291.951	277.786	277.634	292.448	294.524	330.503	331.602	331.026	294.640	294.989	278.426
Take 07	372.332	375.065	332.008	330.450	331.267	393.721	375.667	336.408	333.288	295.595	295.488	280.126	280.841	295.720	294.368	331.446	332.766	330.501	297.829	293.856	280.270
Take 08	373.163	370.228	333.441	331.615	333.156	398.204	379.828	337.702	332.289	295.812	296.316	280.863	279.764	296.687	293.662	331.238	331.237	332.795	297.623	299.090	279.890
Take 09	373.008	370.894	333.043	336.356	337.489	395.736	373.801	337.535	336.587	297.898	296.720	280.490	280.516	296.415	298.400	334.323	335.468	334.048	294.742	301.114	278.398
Take 10	375.257	375.115	330.677	329.954	333.755	395.042	373.370	329.470	331.599	293.685	293.661	276.798	280.406	291.494	294.000	329.031	330.358	330.722	292.414	296.220	276.408
Take 11	370.443	372.745	334.791	329.710	327.732	394.607	377.240	336.722	335.103	294.964	297.057	279.477	278.429	292.463	296.835	332.315	332.510	335.807	299.583	294.687	278.552
Take 12	374.187	368.432	330.698	332.299	328.429	397.430	373.241	335.225	334.825	294.411	294.186	277.893	282.334	293.539	294.448	329.484	328.963	332.472	295.413	296.195	279.151
Take 13	374.812	370.999	332.958	332.970	337.709	397.497	379.434	334.699	333.182	298.608	295.773	281.356	282.376	294.807	295.203	332.350	334.021	334.481	297.764	297.743	280.705
Take 14	369.472	370.509	330.040	328.099	329.387	385.318	372.661	329.526	331.251	295.140	297.538	277.534	277.595	295.056	294.620	334.074	332.281	330.058	293.936	294.086	277.895
Take 15	371.844	368.341	330.152	328.916	328.084	393.248	370.965	327.825	328.424	295.841	294.424	279.265	280.516	291.904	296.189	329.205	330.345	332.078	296.201	296.206	279.742
Take 16	374.855	371.458	332.299	328.104	328.379	396.964	372.999	332.781	330.870	294.329	294.555	278.476	279.099	294.705	295.565	330.052	330.251	330.111	296.504	296.018	278.931
Take 17	372.146	371.089	333.608	332.175	329.699	401.885	377.324	337.266	329.987	295.377	296.320	277.347	277.074	294.522	294.230	331.031	331.700	330.015	296.761	295.653	280.262
Take 18	371.834	369.175	328.727	327.743	326.849	395.475	370.570	329.860	329.237	293.122	297.053	277.264	276.896	292.568	293.831	325.508	332.447	327.936	295.507	294.153	277.012
Take 19	372.249	369.410	329.944	327.775	330.460	393.652	376.367	335.500	328.237	294.637	293.042	277.316	275.882	294.139	295.005	331.529	330.423	329.836	295.510	298.447	277.003
Take 20	370.355	368.431	329.281	325.820	330.454	397.075	371.468	331.118	332.200	292.911	295.449	277.020	277.213	293.556	294.419	332.636	330.101	332.666	294.531	293.732	279.307
Take 21	371.755	370.564	332.072	329.965	327.937	398.877	378.006	333.511	329.524	298.354	295.995	281.116	279.619	294.594	296.504	330.214	330.952	332.931	297.934	295.411	278.769
Alto 3 AVERAGE	**372.442**	**371.104**	**331.209**	**330.203**	**330.748**	**396.164**	**374.384**	**333.374**	**331.820**	**295.351**	**295.162**	**278.600**	**278.995**	**293.948**	**294.479**	**330.962**	**331.348**	**331.928**	**295.998**	**295.996**	**278.734**
Cents RF+3rds	9.093	2.863	5.962	0.698	3.553	15.989	18.094	17.245	9.154	7.592	6.484	6.508	8.959	-0.654	2.468	4.670	6.692	9.718	11.378	11.364	7.339
Cents RF-3rds	13.469	7.239	10.338	5.074	7.929	20.365	22.470	21.621	13.530	11.968	10.860	10.884	13.335	3.722	6.844	9.046	11.068	14.094	15.754	15.740	11.715
Just Int I	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731
Just Int II	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731
Pythagorean	7.820	7.820	3.910	3.910	3.910	-1.955	7.820	3.910	3.910	0.000	0.000	9.775	9.775	0.000	0.000	3.910	3.910	3.910	0.000	0.000	9.775
Meantone	-13.686	-13.686	-6.843	-6.843	-6.843	3.422	-13.686	-6.843	-6.843	0.000	0.000	-17.108	-17.108	0.000	0.000	-6.843	-6.843	-6.843	0.000	0.000	-17.108
Take 01	369.418	370.211	328.278	330.598	327.230	388.708	372.264	327.964	330.131	291.230	291.167	276.002	275.920	292.233	292.316	329.720	328.978	330.271	290.849	287.700	276.020
Take 02																					
Take 03	370.249	373.892	329.984	328.362	325.236	391.019	373.033	330.090	328.575	293.243	291.828	275.514	275.204	291.600	291.186	329.626	330.781	326.915	289.444	291.089	273.796
Take 04	369.688	373.256	328.996	329.075	327.210	389.324	368.887	332.093	327.335	290.553	293.759	276.501	278.010	294.421	288.925	329.874	329.814	330.309	290.681	293.885	276.355
Take 05																					
Take 06	367.092	374.195	329.700	328.598	327.597	392.424	367.209	329.104	327.205	294.305	294.279	275.776	275.959	292.882	293.274	331.274	325.185	327.922	292.670	294.462	274.549
Take 07	370.373	370.147	329.059	330.978	328.103	389.760	370.404	327.533	327.394	293.000	292.912	276.201	276.212	290.472	291.691	329.269	326.604	328.182	291.965	292.186	275.487
Take 08	368.491	369.542	329.133	330.276	330.514	392.156	371.720	327.768	328.859	292.537	293.854	275.964	276.522	292.793	292.432	330.322	327.664	329.641	292.966	292.774	276.181
Take 09	371.647	371.037	330.591	329.876	329.044	392.249	371.493	331.830	328.934	293.441	294.400	275.636	278.079	290.746	291.967	328.901	329.839	330.269	292.186	292.790	275.687
Take 10	370.084	369.387	327.665	328.138	328.418	388.402	368.445	324.507	325.389	291.944	290.162	274.316	274.458	292.359	292.705	328.736	327.475	326.613	290.455	291.148	274.916

Take 11	368.820	367.349	327.213	329.420	328.930	389.914	369.694	330.514	327.513	292.187	293.392	276.957	273.766	292.132	293.213	332.237	332.363	330.421	292.443	293.497	277.382
Take 12	368.129	370.934	325.932	327.386	327.546	392.804	373.069	329.006	329.747	293.165	292.820	274.862	276.826	290.407	292.248	330.469	327.759	327.387	293.605	292.388	277.412
Take 13	367.820	368.937	329.593	325.738	325.601	393.505	370.480	326.201	329.039	289.024	293.128	275.267	273.392	291.207	291.436	328.351	326.604	328.362	289.480	291.521	276.378
Take 14	371.928	365.217	329.269	328.310	328.159	392.457	369.910	329.628	328.990	295.399	292.041	276.064	275.844	289.934	289.723	329.560	326.225	329.111	290.830	291.014	275.394
Take 15	368.287	370.285	324.924	323.277	323.916	390.097	368.970	329.579	327.715	291.727	291.866	276.106	276.757	288.235	290.063	329.715	327.060	328.692	289.877	295.348	276.642
Take 16	367.841	368.382	327.753	328.698	326.804	393.246	368.547	329.719	327.919	291.185	291.206	274.976	275.759	290.988	292.797	330.162	327.205	327.381	290.327	291.720	276.997
Take 17	370.223	370.433	328.885	328.581	327.172	390.286	369.907	325.164	327.977	291.441	294.043	274.973	272.790	292.236	291.136	328.709	324.920	327.377	289.453	292.053	274.872
Take 18	369.519	370.588	326.607	327.467	325.832	392.597	371.381	327.772	325.677	291.522	292.448	273.992	275.757	289.418	289.590	328.793	329.067	329.305	290.941	293.776	276.379
Take 19	367.519	366.759	326.979	324.567	326.088	391.482	367.976	326.473	326.453	288.124	292.458	274.705	274.043	289.251	289.993	324.200	325.140	327.201	290.166	292.694	276.049
Take 20	364.827	368.890	326.643	327.334	326.059	390.170	371.052	327.178	325.447	289.190	291.575	274.803	276.854	290.596	290.925	330.376	326.051	330.337	292.730	294.583	274.461
Take 21	368.264	360.652	326.462	328.770	324.395	391.705	370.800	325.658	326.504	291.802	293.881	274.368	275.430	290.860	288.486	330.242	324.367	325.925	288.009	288.869	275.358
Alto 4 AVERAGE	**368.959**	**369.479**	**328.088**	**328.181**	**327.045**	**391.174**	**370.276**	**328.304**	**327.726**	**291.843**	**292.696**	**275.420**	**275.662**	**291.198**	**291.269**	**329.502**	**327.532**	**328.506**	**291.004**	**292.289**	**275.806**
Cents RF+3rds	-7.175	-4.738	-10.429	-9.934	-15.941	-5.955	-1.007	-9.287	-12.337	-13.095	-8.045	-13.366	-11.846	-16.925	-16.506	-2.984	-13.366	-8.221	-18.080	-10.451	-10.941
Cents RF-3rds	-2.799	-0.362	-6.053	-5.558	-11.565	-1.579	3.369	-4.911	-7.961	-8.719	-3.669	-8.989	-7.470	-12.549	-12.130	1.393	-8.990	-3.845	-13.704	-6.075	-6.565
Just Int I	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731
Just Int II	-13.686	-13.686	-17.596	-17.596	3.910	-29.219	-13.686	3.910	3.910	0.000	0.000	-11.731	-11.731	0.000	0.000	3.910	3.910	-17.596	0.000	0.000	-11.731
Pythagorean	7.820	7.820	3.910	3.910	3.910	-1.955	7.820	3.910	3.910	0.000	0.000	9.775	9.775	0.000	0.000	3.910	3.910	3.910	0.000	0.000	9.775
Meantone	-13.686	-13.686	-6.843	-6.843	-6.843	3.422	-13.686	-6.843	-6.843	0.000	0.000	-17.108	-17.108	0.000	0.000	-6.843	-6.843	-6.843	0.000	0.000	-17.108

Second Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
Take 01	330.040	325.296	328.285	332.763	331.990	411.740	421.775	451.239	439.951	419.540	446.267	372.396	378.274	332.103	331.598	329.763				
Take 02																				
Take 03	330.532	326.517	326.681	328.885	336.190	413.506	417.195	440.606	440.078	413.372	441.285	368.574	371.856	331.065	331.878	330.549				
Take 04	327.630	326.423	328.754	332.210	332.264	408.901	415.462	435.270	437.867	415.023	442.593	371.882	371.727	330.381	332.435	328.671				
Take 05																				
Take 06	330.209	326.267	332.697	331.554	335.342	413.544	416.793	445.344	442.484	418.808	441.405	370.547	371.483	328.535	331.728	331.967				
Take 07	278.537	287.310	281.603	282.611	287.662	414.709	418.649	434.305	434.753	413.358	441.219	370.075	372.632	329.586	329.350	331.057				
Take 08	336.233	330.448	330.504	332.259	336.757	416.233	414.711	436.925	443.017	418.795	443.307	379.049	373.651	331.029	332.951	332.587				
Take 09	330.466	331.381	331.579	336.687	337.751	421.566	418.204	441.730	439.280	419.748	443.840	368.926	373.529	331.020	335.081	332.183				
Take 10	330.481	330.163	330.891	329.216	334.143	419.958	415.065	441.749	447.396	417.908	443.603	368.198	367.401	329.934	323.378	325.428				
Take 11	328.446	326.882	328.384	325.745	334.844	414.002	415.453	438.806	446.255	415.181	442.569	369.658	375.713	334.041	331.150	331.606				
Take 12	277.316	321.339	334.137	335.127	337.257	418.084	420.320	436.922	441.668	416.787	439.455	374.430	374.982	334.234	329.804	332.014				
Take 13	330.497	329.569	327.269	330.275	334.365	410.603	418.557	436.932	438.077	413.525	443.216	370.340	372.933	334.249	333.571	332.313				
Take 14	329.983	319.102	326.077	333.624	331.262	417.092	416.372	436.752	441.865	419.209	439.003	365.082	367.183	328.152	328.476	329.969				
Take 15	277.843	283.353	329.482	330.749	334.627	418.279	415.632	441.678	440.539	412.412	440.546	370.344	372.178	328.484	329.410	328.812				
Take 16	278.592	324.076	332.347	331.328	331.658	412.642	420.935	438.217	437.130	408.633	439.612	369.400	371.073	328.644	330.337	331.099				
Take 17	273.753	328.880	334.315	334.113	330.776	418.585	417.118	435.270	441.110	409.795	440.201	368.083	375.057	327.081	331.619	328.513				
Take 18	326.969	320.101	335.732	334.426	333.234	410.939	416.204	438.024	444.023	411.998	441.496	383.907	372.707	329.547	330.105	327.758				
Take 19	335.947	335.665	334.823	333.011	331.069	416.521	417.636	438.624	440.956	411.883	439.635	369.525	372.430	331.293	330.947	328.743				
Take 20	334.618	334.589	328.720	333.357	333.614	414.874	416.966	436.202	440.460	410.541	441.221	369.503	374.339	329.073	329.661	329.676				
Take 21	278.929	327.168	325.003	331.264	331.745	415.450	416.812	444.390	439.738	412.810	441.110	370.651	371.368	326.535	329.991	331.725				
Alto 1 AVERAGE	**330.927**	**327.286**	**330.315**	**332.033**	**333.827**	**415.117**	**417.361**	**439.420**	**440.876**	**414.701**	**441.662**	**371.083**	**372.659**	**330.262**	**330.709**	**330.233**				
Cents RF+3rds	5.907	-13.246	2.705	11.683	21.013	-1.686	7.646	-3.187	2.540	-3.421	5.624	4.180	11.517	2.427	4.765	2.274				
Cents RF-3rds	7.609	-11.544	4.406	13.385	22.714	0.016	9.348	-1.486	4.241	-1.720	7.325	5.881	13.219	4.128	6.467	3.975				
Just Int I	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995				
Just Int II	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995				
Pythagorean	1.955	1.955	1.955	1.955	1.955	9.775	9.775	0.000	0.000	9.775	0.000	5.865	5.865	1.955	1.955	1.955				
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-17.108	-17.108	0.000	0.000	-17.108	0.000	-10.264	-10.264	-3.421	-3.421	-3.421				
Take 01	328.298	334.061	331.654	334.091	331.295	421.091	420.197	431.027	436.315	415.075	441.260	367.716	369.376	329.805	331.926	331.246				
Take 02																				
Take 03	326.303	327.504	328.724	329.968	330.457	418.185	420.340	436.572	416.713	411.192	439.099	369.063	365.100	328.188	331.498	327.221				
Take 04	329.313	328.299	329.253	326.768	330.395	413.122	417.938	435.269	437.746	415.569	443.039	373.398	370.499	329.925	332.368	331.821				
Take 05																				
Take 06	331.475	332.980	329.854	331.107	334.758	416.985	415.283	439.972	438.480	415.704	441.077	370.611	369.470	330.114	331.154	330.366				

Take 07	330.860	328.680	326.534	326.226	330.591	420.148	412.637	434.335	437.378	412.150	439.182	371.565	368.928	331.474	333.220	328.517
Take 08	327.601	333.768	327.685	332.212	332.922	416.374	420.442	439.845	440.142	414.949	439.839	366.990	369.746	331.741	332.155	330.453
Take 09	329.782	328.577	330.413	330.828	332.691	413.923	418.182	438.016	440.046	416.959	436.766	369.776	369.419	330.619	331.698	331.662
Take 10	328.954	329.392	331.538	322.845	332.117	414.590	410.353	434.874	441.595	416.413	437.510	371.952	369.301	329.026	328.036	332.673
Take 11	327.755	331.772	330.515	332.627	333.345	418.102	419.285	440.313	434.211	415.489	442.002	371.338	370.305	330.675	328.069	331.975
Take 12	327.962	327.335	328.193	328.971	333.046	421.920	424.038	440.682	437.227	417.262	440.728	369.087	369.617	329.329	328.556	329.331
Take 13	328.765	330.474	329.185	330.724	332.400	418.386	416.986	434.294	439.883	414.797	440.702	369.980	371.108	329.030	325.140	333.615
Take 14	327.224	325.755	328.595	328.371	330.847	415.621	414.687	433.179	437.283	415.103	438.146	370.305	369.596	328.925	329.546	330.714
Take 15	325.290	327.533	328.443	329.080	331.238	416.978	417.740	437.779	439.182	415.119	439.294	365.588	368.419	329.750	327.825	331.455
Take 16	328.083	333.490	326.415	330.234	330.343	415.339	415.539	433.564	434.862	410.119	436.794	367.029	370.704	329.418	331.194	329.965
Take 17	316.653	326.085	327.184	327.187	329.529	413.767	415.556	431.875	439.802	415.871	440.823	365.567	370.225	328.645	332.823	330.394
Take 18	328.144	330.546	325.845	327.443	329.945	414.074	415.546	433.798	438.583	417.685	436.499	369.065	370.179	329.004	329.472	328.130
Take 19	327.775	326.058	328.365	327.224	328.550	413.669	415.273	435.489	438.232	414.780	440.433	365.561	368.587	329.190	328.081	327.713
Take 20	330.387	328.448	328.255	327.445	330.413	413.668	414.504	437.814	438.701	409.396	435.113	366.823	373.426	328.872	326.603	329.602
Take 21	327.003	331.073	329.443	328.788	332.616	412.066	412.895	433.180	439.793	411.565	440.760	366.782	367.725	329.717	328.457	325.941
Alto 2 AVERAGE	**327.770**	**329.570**	**328.742**	**329.112**	**331.447**	**416.211**	**416.706**	**435.888**	**437.167**	**414.484**	**439.424**	**368.852**	**369.565**	**329.655**	**329.885**	**330.147**
Cents RF+3rds	-10.689	-1.206	-5.563	-3.612	8.626	2.869	4.929	-17.159	-12.087	-4.329	-3.170	-6.256	-2.916	-0.759	0.450	1.821
Cents RF-3rds	-8.988	0.496	-3.862	-1.910	10.328	4.570	6.630	-15.458	-10.386	-2.627	-1.469	-4.555	-1.215	0.942	2.151	3.522
Just Int I	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995
Just Int II	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995
Pythagorean	1.955	1.955	1.955	1.955	1.955	9.775	9.775	0.000	0.000	9.775	0.000	5.865	5.865	1.955	1.955	1.955
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-17.108	-17.108	0.000	0.000	-17.108	0.000	-10.264	-10.264	-3.421	-3.421	-3.421
Take 01	330.990	328.570	331.005	334.640	333.218	422.654	422.837	442.105	445.243	420.974	447.284	372.172	372.987	332.361	335.004	332.518
Take 02																
Take 03	330.768	330.714	330.808	332.552	333.756	417.997	419.666	442.404	446.081	425.387	449.047	374.465	373.953	332.631	333.085	330.647
Take 04	330.696	329.879	331.557	336.179	332.621	425.316	425.578	450.466	441.341	424.855	446.214	368.560	372.048	331.168	333.931	330.598
Take 05																
Take 06	328.014	330.535	330.381	331.901	332.123	419.863	417.279	444.847	439.922	423.606	443.273	369.596	370.976	330.894	331.423	329.873
Take 07	330.069	329.637	328.782	333.698	333.477	422.998	417.081	442.882	436.351	422.903	445.124	370.222	373.990	332.501	333.177	329.960
Take 08	331.350	330.614	331.107	333.572	334.844	420.585	417.038	444.885	446.004	424.877	445.851	369.571	371.849	332.481	332.927	333.550
Take 09	332.206	334.159	333.147	333.157	332.943	431.594	416.642	437.981	433.674	423.407	443.314	371.332	374.729	333.255	335.046	333.617
Take 10	330.859	328.052	331.782	333.269	333.545	419.862	422.348	443.017	434.822	423.484	440.757	372.875	372.250	330.901	329.733	330.612
Take 11	332.439	332.651	333.303	336.089	336.255	423.697	419.117	445.102	444.158	417.957	449.916	371.655	374.604	331.675	334.835	331.336
Take 12	331.502	332.486	331.210	334.775	333.133	420.511	422.423	447.849	444.017	424.688	446.198	369.321	371.864	332.136	332.277	329.878
Take 13	333.590	334.995	330.667	333.591	335.480	416.503	417.953	447.419	436.309	425.260	448.027	371.364	368.599	332.165	332.339	330.783
Take 14	328.816	328.993	327.567	330.805	333.081	415.172	420.904	437.596	438.304	425.451	440.755	368.796	370.565	328.766	327.083	329.274
Take 15	329.021	331.694	332.984	334.184	333.497	420.879	420.187	438.681	441.577	418.042	441.275	370.228	369.871	329.902	330.891	328.888
Take 16	331.384	333.600	330.710	331.966	330.561	422.829	415.485	439.933	439.634	423.555	444.775	370.380	370.749	331.229	331.162	329.780
Take 17	329.470	329.507	328.039	331.762	330.925	420.239	419.162	445.516	440.043	420.391	446.916	367.622	370.062	330.193	332.458	329.070
Take 18	328.190	329.022	329.418	329.079	331.628	416.184	417.661	441.832	442.769	420.813	446.891	374.469	369.504	330.186	331.305	328.937
Take 19	328.665	328.859	329.486	329.151	331.711	422.182	418.413	441.584	441.950	418.562	445.651	364.735	368.755	330.114	330.028	329.618
Take 20	330.241	329.194	331.070	331.793	335.396	421.302	417.675	434.512	443.449	420.672	441.132	374.546	375.250	329.980	332.937	329.873
Take 21	330.449	328.727	328.953	329.261	331.772	421.156	421.022	443.939	441.296	426.359	446.942	375.927	371.276	330.403	331.296	328.756
Alto 3 AVERAGE	**330.459**	**330.626**	**330.630**	**332.707**	**333.156**	**421.133**	**419.393**	**442.766**	**440.892**	**422.697**	**445.229**	**370.939**	**371.783**	**331.207**	**332.154**	**330.398**
Cents RF+3rds	3.457	4.329	4.354	15.192	17.530	23.221	16.055	9.944	2.601	29.640	19.547	3.509	7.445	7.373	12.317	3.139
Cents RF-3rds	5.159	6.031	6.055	16.893	19.231	24.922	17.757	11.645	4.302	31.341	21.248	5.210	9.146	9.075	14.018	4.840
Just Int I	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995
Just Int II	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995
Pythagorean	1.955	1.955	1.955	1.955	1.955	9.775	9.775	0.000	0.000	9.775	0.000	5.865	5.865	1.955	1.955	1.955
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-17.108	-17.108	0.000	0.000	-17.108	0.000	-10.264	-10.264	-3.421	-3.421	-3.421
Take 01	330.522	328.812	328.381	331.812	333.533	413.721	413.939	444.598	444.695	418.210	446.854	371.825	371.400	331.116	329.687	328.176
Take 02																
Take 03	329.324	328.736	328.760	327.948	334.250	416.789	416.505	444.253	446.104	418.939	447.832	371.025	369.347	329.948	329.708	328.442
Take 04	327.401	331.503	329.925	328.312	330.727	415.573	415.938	443.527	442.579	419.071	447.020	368.888	370.083	330.082	330.329	329.737

Take 05																							
Take 06	330.543	329.746	328.721	331.679	332.973	416.570	416.828	442.651	441.867	415.488	443.200	370.944	369.208	328.872	329.171	327.430							
Take 07	329.034	326.576	328.822	330.764	330.863	413.875	413.739	438.534	439.490	416.630	444.452	369.027	368.322	329.263	329.930	328.004							
Take 08	326.916	326.602	326.824	329.761	332.824	420.000	417.309	440.845	445.547	419.812	445.893	371.912	370.709	329.215	332.025	330.081							
Take 09	328.878	328.264	328.532	331.295	330.253	415.971	415.727	440.240	441.872	418.498	441.779	368.322	370.917	329.159	328.735	329.147							
Take 10	326.662	327.734	328.421	331.330	330.145	416.106	415.493	437.891	443.656	418.693	443.593	367.909	369.094	329.264	330.013	328.636							
Take 11	329.400	330.957	330.739	330.340	333.798	418.401	419.156	443.868	443.999	418.931	446.012	368.969	370.636	330.812	332.528	328.440							
Take 12	328.864	329.125	329.417	332.513	332.806	418.445	418.406	442.575	445.282	417.144	444.630	370.659	371.328	329.856	330.894	327.710							
Take 13	327.875	326.666	327.714	331.737	332.891	419.158	416.594	442.167	443.176	420.481	445.771	372.490	371.252	330.166	331.455	329.406							
Take 14	328.994	326.146	328.662	328.713	331.516	412.150	414.876	433.516	440.104	417.097	442.676	364.319	367.840	329.259	329.738	328.762							
Take 15	329.542	325.292	328.499	331.251	330.529	414.813	414.813	438.306	439.666	419.661	443.180	366.971	366.513	328.316	328.397	328.283							
Take 16	326.961	325.177	326.727	330.982	331.587	418.061	417.470	438.747	444.465	418.195	443.232	368.250	367.414	329.993	330.408	328.017							
Take 17	326.288	327.103	326.989	329.479	332.229	416.354	413.642	440.158	441.182	417.605	441.627	364.410	366.797	327.657	329.554	327.340							
Take 18	328.245	324.787	327.896	328.674	331.973	414.297	414.698	440.316	442.358	419.538	445.285	368.456	370.166	330.441	330.561	328.227							
Take 19	326.214	324.192	325.310	328.761	330.503	415.486	414.742	438.673	441.853	421.111	440.467	368.607	368.928	328.631	327.647	327.172							
Take 20	326.066	324.379	326.621	330.872	334.355	419.441	412.836	438.792	440.867	416.258	444.052	371.453	368.406	330.560	329.552	326.196							
Take 21	329.598	322.015	327.851	328.558	330.941	414.872	415.839	438.433	441.896	418.696	444.398	368.423	368.761	327.252	328.288	326.529							
Alto 4 AVERAGE	**328.280**	**327.043**	**328.148**	**330.252**	**332.037**	**416.320**	**415.713**	**440.426**	**442.666**	**418.424**	**444.313**	**369.098**	**369.322**	**329.467**	**329.927**	**328.197**							
Cents RF+3rds	-7.995	-14.533	-8.692	2.371	11.703	3.324	0.797	0.770	9.555	12.051	15.984	-5.105	-4.053	-1.750	0.669	-8.436							
Cents RF-3rds	-6.293	-12.832	-6.991	4.072	13.404	5.025	2.498	2.472	11.256	13.752	17.685	-3.404	-2.352	-0.049	2.371	-6.735							
Just Int I	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995							
Just Int II	1.995	1.995	1.995	1.995	1.995	-11.731	-11.731	0.000	0.000	-11.731	0.000	-15.641	-15.641	1.995	1.995	1.995							
Pythagorean	1.955	1.955	1.955	1.955	1.955	9.775	9.775	0.000	0.000	9.775	0.000	5.865	5.865	1.955	1.955	1.955							
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-17.108	-17.108	0.000	0.000	-17.108	0.000	-10.264	-10.264	-3.421	-3.421	-3.421							
	Third Phrase																						
	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
Take 01	333.584	335.035	335.828	336.085	331.745	333.249	335.371	351.981	354.836	301.463	296.941	335.602	352.851	335.259	330.417	326.479	294.198	281.173	295.140	280.314			
Take 02																							
Take 03	332.098	331.500	328.986	332.118	328.965	327.104	333.244	349.342	350.119	294.236	294.480	325.882	350.000	330.301	328.707	328.654	291.545	277.679	293.891	276.149			
Take 04	333.269	335.580	332.593	335.108	325.312	326.645	326.593	343.984	352.728	297.740	299.007	330.247	353.181	331.482	324.666	327.224	296.748	285.285	292.786	278.411			
Take 05																							
Take 06	331.766	330.223	332.930	334.655	328.266	0.000	327.659	350.324	350.967	296.925	300.286	323.521	339.909	330.677	336.399	333.473	295.860	280.953	300.737	278.129			
Take 07	335.308	337.106	332.389	330.837	329.978	331.446	328.231	345.933	350.404	296.043	297.364	331.522	352.722	329.957	325.396	328.335	297.179	289.977	298.477	280.236			
Take 08	334.292	335.088	335.694	334.306	327.812	327.105	330.612	351.930	344.992	293.823	295.973	332.730	354.670	329.387	331.596	326.813	288.904	278.619	293.843	278.349			
Take 09	336.623	331.005	334.638	334.613	324.151	330.141	333.681	348.503	353.540	295.267	294.572	334.210	350.896	328.963	336.203	329.894	291.554	276.796	294.149	276.761			
Take 10	331.554	331.745	332.165	331.251	328.213	328.810	333.223	348.137	350.456	297.881	297.955	333.945	352.475	329.067	329.016	328.033	295.672	282.140	298.261	281.745			
Take 11	302.573	348.954	335.474	330.677	330.309	330.017	333.848	347.995	354.217	298.308	298.261	326.586	350.717	330.490	327.019	326.068	292.861	283.581	298.193	280.699			
Take 12	333.418	328.741	334.276	331.868	330.559	329.715	332.929	347.574	347.702	293.854	298.423	332.845	357.339	330.957	331.259	328.928	294.064	277.634	295.191	280.613			
Take 13	335.713	335.343	334.706	334.599	332.093	329.852	329.561	345.248	352.892	295.117	301.252	334.105	354.410	328.672	329.483	326.777	289.805	277.644	293.228	278.858			
Take 14	329.503	328.506	329.732	331.124	329.437	328.841	328.130	346.115	350.141	293.550	295.280	333.152	353.159	335.814	329.709	328.864	292.615	275.648	291.410	277.251			
Take 15	332.472	335.601	330.337	330.713	327.556	324.023	329.719	341.379	349.945	295.313	295.371	333.238	348.388	325.717	321.822	329.208	294.448	273.182	293.959	275.737			
Take 16	330.787	327.756	331.074	332.878	330.876	327.831	328.799	345.611	359.103	292.474	294.445	339.584	352.898	336.901	329.945	331.722	291.035	282.843	288.796	275.215			
Take 17	331.967	330.157	328.700	328.665	326.543	326.513	329.255	342.436	347.285	293.688	292.974	335.257	350.604	328.852	323.121	328.566	298.563	276.861	295.018	277.620			
Take 18	332.378	333.310	333.245	331.416	325.446	326.986	336.320	346.882	347.316	294.525	296.977	329.812	348.112	326.391	326.899	328.267	291.119	276.556	294.967	276.120			
Take 19	333.476	335.141	328.433	330.166	325.590	327.051	325.199	342.533	346.783	293.969	291.496	330.070	345.906	330.768	330.208	328.791	292.655	281.609	293.698	276.794			
Take 20	331.113	330.390	326.903	328.887	326.052	324.988	324.109	345.431	344.158	295.285	288.980	332.143	350.827	334.922	335.664	331.969	295.997	280.466	296.692	280.273			
Take 21	332.831	332.617	330.497	336.581	328.678	330.866	326.995	344.071	346.216	295.970	294.322	333.920	353.221	330.337	331.893	329.695	289.204	280.469	296.150	278.860			
Alto 1 AVERAGE	**332.897**	**332.491**	**332.032**	**332.450**	**328.294**	**328.399**	**330.183**	**346.600**	**350.347**	**295.549**	**296.019**	**332.492**	**351.799**	**330.785**	**328.637**	**328.829**	**293.370**	**279.953**	**294.978**	**278.323**			
Cents RF+3rds	10.363	8.250	5.854	8.034	-13.746	-13.191	-3.811	-19.802	-1.190	4.346	7.097	8.252	5.969	-0.658	-11.939	-10.923	-8.466	10.494	1.000	0.381			
Cents RF-3rds	14.630	12.518	10.121	12.301	-9.478	-8.924	0.456	-15.535	3.077	8.613	11.364	12.519	10.237	3.609	-7.672	-6.655	-4.198	14.762	5.267	4.648			
Just Int I	1.955	1.955	1.955	1.955	-19.552	-19.552	-19.552	-7.819	-7.819	-23.461	-23.461	-19.551	-7.820	-19.551	-19.551	-19.551	-23.461	-35.192	-50.725	-35.192			
Just Int II	1.955	1.955	1.955	1.955	1.954	1.954	1.954	13.687	13.687	-1.955	-1.955	1.955	13.686	1.955	1.955	1.955	-1.955	-13.686	-29.219	-13.686			
Pythagorean	1.955	1.955	1.955	1.955	1.955	1.955	1.955	-7.820	-7.820	-1.955	-1.955	1.955	-7.820	1.955	1.955	1.955	-1.955	7.820	-1.955	7.820			
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	13.686	13.686	3.422	3.422	-3.421	13.686	-3.421	-3.421	-3.421	3.422	-13.686	3.422	-13.686			

Take 01	332.000	334.289	332.072	333.660	330.000	330.879	328.739	342.774	350.627	292.770	293.391	333.602	352.690	332.693	334.347	332.013	290.980	279.255	296.536	274.850
Take 02																				
Take 03	332.366	332.676	328.317	330.428	330.231	330.039	325.262	340.379	350.117	292.354	294.445	328.699	348.454	334.114	330.317	330.197	299.957	284.017	295.315	276.724
Take 04	331.313	332.293	334.630	332.552	329.712	331.084	329.132	345.271	342.116	294.196	298.068	330.283	348.542	330.038	330.600	327.650	291.488	279.704	296.482	275.014
Take 05																				
Take 06	331.473	332.159	329.921	331.473	329.530	327.881	0.000	0.000	349.069	293.668	296.172	331.811	348.000	330.614	329.341	331.966	295.214	280.641	296.498	276.815
Take 07	332.540	329.280	327.828	328.346	328.525	326.742	324.840	342.638	344.946	297.886	300.587	330.291	348.676	328.958	332.031	329.244	295.313	279.661	292.548	277.125
Take 08	331.282	331.660	329.912	330.367	328.744	334.671	329.229	342.438	354.050	293.757	297.505	329.413	347.872	332.802	331.055	330.149	294.778	285.593	299.083	278.295
Take 09	332.218	332.334	328.125	332.806	330.079	331.624	330.402	345.355	342.444	294.364	298.271	332.350	352.504	335.925	332.891	329.679	290.992	278.921	293.744	277.568
Take 10	329.589	331.613	329.830	330.298	329.589	329.165	332.030	346.009	349.491	299.436	300.867	330.367	351.284	333.972	329.525	329.907	295.845	282.818	294.018	279.097
Take 11	328.888	332.324	330.337	331.643	331.444	328.842	326.209	345.578	345.587	293.128	296.082	329.782	350.800	335.032	333.414	331.808	295.465	281.443	298.352	278.778
Take 12	329.823	331.139	330.016	333.417	327.742	326.898	329.869	343.500	346.840	295.841	298.438	328.770	345.445	335.966	333.331	330.274	294.604	278.893	293.316	277.863
Take 13	331.329	332.536	330.308	331.719	329.208	328.249	328.434	342.470	344.885	294.081	293.023	329.787	344.026	328.947	328.680	330.256	292.708	279.855	295.998	277.035
Take 14	327.458	326.522	328.898	331.515	328.575	327.865	326.853	342.524	344.081	294.336	294.789	328.292	348.450	334.385	330.160	330.824	293.467	279.114	293.082	274.642
Take 15	331.386	328.501	328.116	329.340	326.944	327.163	326.516	343.476	347.133	292.231	293.202	327.741	346.932	332.846	329.252	326.613	295.738	280.810	293.328	279.820
Take 16	330.929	329.744	329.891	330.331	328.265	325.132	325.243	338.246	341.422	292.866	297.798	325.221	346.414	333.931	329.636	331.358	294.226	276.675	297.632	275.510
Take 17	331.429	332.758	330.572	329.143	330.196	326.868	327.179	339.159	344.080	291.713	293.654	325.965	348.728	332.444	329.288	328.626	292.891	281.082	295.828	276.563
Take 18	329.644	329.437	328.287	328.192	326.753	325.349	324.818	341.563	347.474	291.495	296.286	326.526	344.842	332.700	0.000	327.664	293.837	281.409	295.820	274.910
Take 19	331.848	330.315	328.322	332.598	326.590	323.902	327.667	339.645	343.430	292.639	292.995	326.764	348.822	328.871	328.661	326.048	292.234	277.724	293.134	277.757
Take 20	330.271	328.724	327.870	328.231	330.197	328.348	328.836	345.645	346.426	288.905	295.576	331.121	348.885	327.823	332.817	328.833	294.229	280.534	295.783	273.369
Take 21	330.902	330.356	329.209	330.682	327.532	325.383	328.229	340.872	340.724	291.609	291.973	334.090	349.494	331.020	331.006	330.810	295.435	282.380	294.283	275.082
Alto 2 AVERAGE	330.878	330.982	329.603	330.881	328.940	328.215	327.749	342.641	346.050	293.541	295.954	329.520	348.466	332.267	330.909	329.680	294.179	280.554	295.304	276.674
Cents RF+3rds	-0.169	0.373	-6.854	-0.155	-10.342	-14.161	-16.619	-39.692	-22.556	-7.458	6.717	-7.292	-10.507	7.084	-0.011	-6.451	-3.697	14.206	2.913	-9.903
Cents RF-3rds	4.098	4.640	-2.587	4.112	-6.074	-9.894	-12.351	-35.424	-18.288	-3.190	10.984	-3.025	-6.240	11.351	4.256	-2.184	0.570	18.473	7.180	-5.635
Just Int I	1.955	1.955	1.955	1.955	-19.552	-19.552	-19.552	-7.819	-7.819	-23.461	-23.461	-19.551	-7.820	-19.551	-19.551	-19.551	-23.461	-35.192	-50.725	-35.192
Just Int II	1.955	1.955	1.955	1.955	1.954	1.954	1.954	13.687	13.687	-1.955	-1.955	1.955	13.686	1.955	1.955	1.955	-1.955	-13.686	-29.219	-13.686
Pythagorean	1.955	1.955	1.955	1.955	1.955	1.955	1.955	-7.820	-7.820	-1.955	-1.955	1.955	-7.820	1.955	1.955	1.955	-1.955	7.820	-1.955	7.820
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	13.686	13.686	3.422	3.422	-3.421	13.686	-3.421	-3.421	-3.421	3.422	-13.686	3.422	-13.686
Take 01	336.262	333.073	331.724	332.946	332.439	332.030	332.951	351.638	349.385	297.295	301.034	333.297	350.880	333.750	332.841	331.004	296.070	279.393	293.365	279.518
Take 02																				
Take 03	332.622	331.038	333.147	332.641	329.711	330.183	332.701	346.997	346.271	295.039	295.727	333.709	351.457	336.892	329.366	330.266	293.609	281.250	299.772	280.520
Take 04	335.294	331.481	333.119	332.463	329.383	330.198	331.861	350.921	347.433	295.199	295.109	332.837	352.859	331.147	331.100	328.665	295.593	280.131	296.682	280.473
Take 05																				
Take 06	330.633	329.000	328.023	333.091	327.527	331.935	330.093	347.584	352.274	294.306	294.768	332.218	350.668	338.413	330.946	330.023	296.823	283.712	294.013	280.367
Take 07	335.036	332.181	331.872	331.546	328.748	331.394	327.994	346.574	352.323	296.695	296.782	332.929	354.547	340.882	327.537	331.951	292.135	281.177	297.231	280.724
Take 08	336.187	333.756	332.512	331.088	330.462	330.195	331.093	352.159	349.800	295.017	293.861	333.132	348.186	332.512	330.698	329.456	290.705	280.092	296.648	279.255
Take 09	331.616	334.408	331.370	332.721	328.886	330.187	330.267	344.682	351.571	294.941	296.688	331.057	355.049	327.516	331.008	329.827	295.161	279.475	298.642	279.662
Take 10	333.320	334.043	329.475	329.693	329.222	329.613	332.660	352.232	349.645	297.124	294.608	329.724	348.581	330.135	326.686	328.617	297.562	282.456	297.930	279.653
Take 11	336.620	333.730	330.836	331.424	332.727	332.636	332.797	349.095	349.284	296.793	300.000	332.866	358.192	329.636	330.862	331.919	295.171	283.020	295.870	280.455
Take 12	334.731	335.318	330.988	332.275	329.645	328.989	329.997	351.001	347.282	297.075	291.853	331.662	350.552	322.517	331.418	329.894	294.935	283.402	295.677	278.892
Take 13	335.535	335.455	332.564	333.710	329.818	330.403	332.026	348.840	351.998	298.714	295.523	326.849	352.409	332.685	331.816	332.283	293.340	280.859	296.849	280.795
Take 14	330.905	330.670	328.093	328.035	327.883	331.406	329.090	344.761	347.526	296.593	293.826	332.697	352.610	331.296	332.012	327.712	290.910	279.285	295.153	278.019
Take 15	329.992	331.350	327.922	328.123	330.171	328.367	330.794	347.491	348.284	295.581	294.260	330.855	355.861	330.646	328.074	326.220	294.405	277.650	294.529	277.587
Take 16	331.960	330.979	330.442	330.639	328.715	327.488	328.779	344.210	350.701	294.163	294.896	331.521	347.389	332.421	326.384	329.932	293.749	279.207	294.402	277.752
Take 17	332.954	331.387	329.663	331.201	329.964	329.565	327.942	350.098	347.527	295.102	295.973	330.823	351.900	330.973	330.424	328.385	296.897	278.734	295.026	276.707
Take 18	331.191	328.945	327.835	330.153	330.773	325.538	327.068	346.469	350.128	295.523	290.521	328.078	353.873	334.412	329.520	327.973	297.358	282.484	295.088	276.757
Take 19	333.773	331.038	329.421	330.244	328.686	327.385	329.806	348.683	348.053	294.885	292.842	333.832	350.280	327.346	328.666	327.203	294.393	280.892	294.457	278.484
Take 20	333.435	335.961	331.533	333.157	332.914	331.287	330.593	350.145	349.558	296.966	296.124	333.081	356.378	336.320	331.226	328.545	298.428	286.364	298.118	278.791
Take 21	335.495	335.674	329.978	330.630	329.414	331.532	329.905	345.741	348.102	297.340	297.690	333.233	352.510	328.991	332.450	332.198	299.066	285.233	295.945	280.029
Alto 3 AVERAGE	333.556	332.605	330.554	331.357	329.847	330.017	330.443	348.385	349.376	296.018	295.373	331.811	352.325	332.026	330.160	329.583	295.069	281.306	296.074	279.181
Cents RF+3rds	13.783	8.839	-1.869	2.333	-5.574	-4.679	-2.448	-10.909	-5.994	7.095	3.316	4.702	8.559	5.824	-3.933	-6.961	1.533	18.839	7.416	5.711
Cents RF-3rds	18.051	13.106	2.398	6.600	-1.307	-0.412	1.819	-6.642	-1.726	11.362	7.583	8.969	12.826	10.092	0.334	-2.694	5.800	23.106	11.684	9.979
Just Int I	1.955	1.955	1.955	1.955	-19.552	-19.552	-19.552	-7.819	-7.819	-23.461	-23.461	-19.551	-7.820	-19.551	-19.551	-19.551	-23.461	-35.192	-50.725	-35.192
Just Int II	1.955	1.955	1.955	1.955	1.954	1.954	1.954	13.687	13.687	-1.955	-1.955	1.955	13.686	1.955	1.955	1.955	-1.955	-13.686	-29.219	-13.686

Pythagorean	1.955	1.955	1.955	1.955	1.955	1.955	1.955	-7.820	-7.820	-1.955	-1.955	1.955	-7.820	1.955	1.955	1.955	-1.955	7.820	-1.955	7.820
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	13.686	13.686	3.422	3.422	-3.421	13.686	-3.421	-3.421	-3.421	3.422	-13.686	3.422	-13.686
Take 01	331.012	328.758	329.428	331.363	329.631	326.611	330.576	349.527	349.454	294.492	291.144	329.440	349.271	331.605	329.483	328.379	295.088	281.286	294.160	275.887
Take 02																				
Take 03	331.684	328.318	329.221	329.746	329.893	326.523	328.473	346.239	348.649	293.789	295.238	330.293	348.360	329.925	328.995	328.017	291.200	278.695	293.938	275.376
Take 04	333.524	331.864	329.500	331.429	331.057	330.471	329.219	348.218	348.660	293.589	294.248	328.882	348.909	329.933	326.861	328.373	289.355	275.765	292.598	275.081
Take 05																				
Take 06	332.921	330.531	329.274	331.256	330.520	327.637	327.747	347.105	349.471	292.090	295.690	328.786	347.299	331.377	325.400	328.558	291.031	274.644	293.508	275.299
Take 07	334.195	330.609	328.404	332.438	329.801	328.212	329.268	349.844	349.929	292.865	291.241	329.827	350.710	327.756	327.925	327.006	292.129	278.458	293.077	274.533
Take 08	333.732	330.144	331.492	334.869	330.541	327.997	329.757	348.772	346.616	291.058	295.432	329.602	347.935	326.614	327.055	329.884	292.118	277.634	294.553	275.282
Take 09	331.889	328.174	326.381	330.780	330.053	326.245	327.305	348.762	350.428	292.745	291.482	330.419	352.758	328.036	329.149	328.807	292.861	281.421	293.584	276.012
Take 10	332.976	330.908	329.489	330.796	330.385	330.713	329.509	345.719	351.825	294.855	293.246	328.839	349.047	328.794	327.559	327.505	291.290	276.941	292.001	274.309
Take 11	333.490	330.108	331.048	332.438	330.497	327.667	332.319	348.165	350.458	294.176	296.739	328.617	348.534	330.242	327.016	328.879	294.357	277.037	293.963	276.312
Take 12	334.564	330.112	330.291	331.391	330.784	331.049	331.456	347.718	350.212	292.826	290.602	330.009	347.952	331.260	328.109	327.386	293.359	278.471	291.858	274.622
Take 13	333.958	330.705	331.232	332.833	330.973	330.045	330.581	349.313	349.741	292.589	293.043	329.736	349.663	331.636	326.031	328.779	287.931	276.336	291.174	275.228
Take 14	333.895	330.653	328.537	331.999	330.867	330.723	328.422	344.708	349.596	289.386	291.792	329.737	348.158	330.227	326.780	329.615	293.150	277.598	293.163	275.077
Take 15	332.541	330.422	327.995	331.394	329.715	326.456	327.337	346.888	349.737	291.559	288.386	328.789	346.048	328.916	324.057	327.789	289.517	277.393	293.459	274.862
Take 16	331.588	332.234	329.549	330.731	329.091	327.430	330.483	343.393	348.691	290.543	291.560	329.256	350.029	329.401	326.425	326.602	290.089	275.109	291.835	276.106
Take 17	331.539	329.425	328.921	333.130	330.899	328.283	327.505	346.483	348.266	292.146	289.303	330.479	350.104	327.116	326.112	328.346	291.074	275.716	292.616	274.847
Take 18	332.293	331.300	327.358	330.657	328.768	329.053	328.240	345.721	349.290	291.355	293.685	327.276	349.343	330.475	326.844	326.530	289.686	277.728	291.268	274.912
Take 19	330.977	327.606	326.888	327.943	328.023	327.396	329.021	347.468	349.417	293.157	291.387	328.920	347.899	322.593	326.711	326.214	290.264	278.810	290.944	274.126
Take 20	332.253	328.695	329.037	330.003	329.508	327.127	326.131	347.641	349.026	290.959	290.354	330.223	347.489	329.672	323.868	325.739	288.147	278.663	292.317	275.374
Take 21	332.027	327.693	326.569	328.043	328.860	327.729	327.121	347.072	349.073	292.624	290.744	327.544	344.364	334.462	327.847	327.570	293.179	278.743	292.099	273.790
Alto 4 AVERAGE	**332.687**	**329.908**	**328.980**	**331.223**	**329.993**	**328.283**	**328.972**	**347.303**	**349.397**	**292.463**	**292.385**	**329.299**	**348.625**	**329.476**	**326.959**	**327.894**	**291.359**	**277.708**	**292.743**	**275.107**
Cents RF+3rds	9.270	-5.252	-10.132	1.634	-4.808	-13.805	-10.171	-16.296	-5.890	-13.824	-14.286	-8.454	-9.720	-7.523	-20.797	-15.857	-20.371	-3.450	-12.170	-19.739
Cents RF-3rds	13.537	-0.985	-5.865	5.901	-0.541	-9.537	-5.904	-12.029	-1.623	-9.557	-10.019	-4.187	-5.452	-3.256	-16.530	-11.590	-16.104	0.818	-7.902	-15.472
Just Int I	1.955	1.955	1.955	1.955	-19.552	-19.552	-19.552	-7.819	-7.819	-23.461	-23.461	-19.551	-7.820	-19.551	-19.551	-19.551	-23.461	-35.192	-50.725	-35.192
Just Int II	1.955	1.955	1.955	1.955	1.954	1.954	1.954	13.687	13.687	-1.955	-1.955	1.955	13.686	1.955	1.955	1.955	-1.955	-13.686	-29.219	-13.686
Pythagorean	1.955	1.955	1.955	1.955	1.955	1.955	1.955	-7.820	-7.820	-1.955	-1.955	1.955	-7.820	1.955	1.955	1.955	-1.955	7.820	-1.955	7.820
Meantone	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	13.686	13.686	3.422	3.422	-3.421	13.686	-3.421	-3.421	-3.421	3.422	-13.686	3.422	-13.686

Fourth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
Take 01	295.302	297.088	295.773	284.055	249.190	333.972	328.353	334.165	335.400	291.216	280.684	376.174	373.186	392.289	378.574	340.596	292.458	279.011	280.451	293.969
Take 02																				
Take 03	294.144	290.434	292.027	280.668	256.407	329.397	329.950	327.979	326.251	295.590	281.064	377.286	367.660	388.024	373.458	281.789	295.887	276.720	274.601	293.806
Take 04	296.230	298.111	297.653	281.743	258.178	335.414	335.306	331.835	326.579	293.511	273.913	369.299	369.256	388.989	367.311	329.906	293.319	275.625	278.526	293.449
Take 05																				
Take 06	294.608	297.261	292.541	278.761	248.332	329.382	327.856	331.924	330.649	298.400	284.246	377.960	368.929	390.265	365.025	322.462	294.433	279.242	283.402	294.544
Take 07	295.922	295.323	294.836	282.439	249.830	330.572	329.901	329.497	327.345	296.680	284.211	371.955	369.501	387.055	368.546	324.105	294.184	279.462	280.876	293.925
Take 08	295.618	293.941	294.938	279.275	245.954	328.026	329.767	324.316	327.126	294.066	287.995	371.037	374.005	395.133	367.190	327.898	296.192	279.955	281.520	293.716
Take 09	292.514	293.614	292.729	277.708	244.176	333.216	332.234	332.863	327.089	294.580	287.247	374.167	373.288	390.661	369.371	323.366	295.271	276.893	278.486	293.727
Take 10	295.339	294.921	296.078	284.813	259.618	330.671	331.154	331.473	331.828	299.414	281.789	372.652	367.976	386.842	368.542	327.915	294.840	280.195	281.735	294.648
Take 11	298.620	297.553	299.296	275.154	255.278	329.564	327.757	330.606	327.023	300.400	287.464	371.325	369.006	392.613	369.207	324.660	297.670	282.027	283.933	296.784
Take 12	293.627	294.034	296.511	283.760	250.105	336.323	330.795	329.863	327.578	290.397	278.835	377.402	368.249	396.075	367.607	327.094	293.499	277.556	277.019	295.056
Take 13	297.848	294.594	297.891	281.336	251.559	334.930	332.419	330.628	324.280	297.899	281.548	369.790	367.266	391.172	368.938	326.482	295.072	276.638	277.760	295.845
Take 14	293.404	297.731	296.653	276.115	247.884	335.805	332.683	331.200	331.650	295.472	279.634	367.147	367.082	389.062	370.588	325.506	293.433	276.463	278.823	293.554
Take 15	291.692	296.653	294.507	281.681	248.998	330.408	329.124	326.935	329.546	294.288	283.742	362.154	364.588	389.862	363.584	320.191	294.528	278.537	277.194	295.164
Take 16	294.310	293.053	294.232	284.398	250.568	327.906	324.544	326.461	326.686	291.692	294.903	372.764	373.459	394.041	371.092	337.572	291.604	276.581	275.216	291.780
Take 17	296.032	298.607	295.140	278.971	244.503	328.608	328.297	331.690	328.936	295.742	274.917	367.516	366.725	390.448	368.151	326.258	294.180	278.650	279.735	290.544
Take 18	295.956	294.647	293.684	281.174	249.236	328.125	327.907	326.800	326.157	293.133	276.923	373.688	367.598	394.198	370.645	323.008	295.288	277.030	278.851	292.077
Take 19	293.326	290.077	293.661	280.982	256.127	323.794	326.602	326.597	330.350	297.578	279.772	369.286	366.186	393.750	365.875	328.635	292.317	277.608	279.712	291.039
Take 20	293.358	294.368	293.137	282.010	251.344	326.088	328.882	328.584	328.844	290.167	268.706	366.284	367.198	395.796	374.553	324.985	294.678	278.747	279.984	294.793
Take 21	295.721	292.079	297.514	279.940	253.525	339.204	333.382	332.866	333.323	295.973	273.637	375.128	370.672	389.732	367.207	324.469	294.185	276.506	284.268	294.377
Alto 1 AVERAGE	294.925	294.952	295.200	280.789	251.095	331.127	329.837	329.804	328.770	295.063	281.462	371.738	369.044	391.369	369.235	325.135	294.370	278.076	279.584	293.831

Cents RF+3rds	6.915	7.076	8.530	21.880	28.381	7.358	0.605	0.432	-5.004	7.727	26.026	7.641	-4.951	-3.266	-4.054	-24.252	3.658	5.074	14.436	0.485
Cents RF-3rds	10.824	10.985	12.439	25.789	32.289	11.267	4.514	4.340	-1.096	11.635	29.935	11.549	-1.042	0.642	-0.145	-20.343	7.566	8.983	18.344	4.394
Just Int I	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Just Int II	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Pythagorean	0.000	0.000	0.000	9.775	5.865	3.910	3.910	3.910	3.910	0.000	9.775	7.820	7.820	-1.955	7.820	3.910	0.000	9.775	9.775	0.000
Meantone	0.000	0.000	0.000	-17.108	-10.264	-6.843	-6.843	-6.843	-6.843	0.000	-17.108	-13.686	-13.686	3.422	-13.686	-6.843	0.000	-17.108	-17.108	0.000
Take 01	291.889	298.588	294.611	278.613	250.962	333.163	327.314	331.097	331.648	292.067	277.129	368.373	369.616	388.594	362.137	333.486	296.505	281.171	279.250	293.497
Take 02																				
Take 03	292.080	296.466	296.073	279.022	249.604	328.310	325.718	326.136	326.255	291.398	270.789	370.295	370.183	388.279	369.774	333.286	296.706	276.647	281.489	287.082
Take 04	293.740	295.580	296.255	279.114	240.808	331.241	329.549	328.374	328.877	292.607	277.097	369.607	368.344	385.177	365.690	332.466	295.421	275.521	278.301	288.901
Take 05																				
Take 06	294.301	296.692	296.637	280.285	246.329	329.978	329.823	331.677	330.379	295.075	279.179	371.435	369.144	389.372	368.341	328.121	292.435	267.519	274.684	309.957
Take 07	296.433	297.063	296.017	275.555	249.920	330.327	329.254	329.201	328.158	293.023	278.154	369.113	368.946	389.071	368.992	332.412	293.678	273.736	279.661	294.000
Take 08	291.193	295.870	294.853	278.613	249.843	332.965	330.013	331.597	326.648	293.612	278.087	373.353	368.980	386.871	365.627	330.632	295.053	277.121	279.299	293.471
Take 09	293.657	296.688	295.570	275.934	250.241	329.904	329.217	330.289	327.513	290.573	279.261	372.873	368.963	385.485	0.000	328.915	293.780	279.304	274.345	297.726
Take 10	294.182	298.944	297.325	280.473	248.879	334.370	329.975	327.392	327.464	293.777	281.241	372.302	368.565	386.762	368.243	328.189	292.358	277.905	278.040	292.857
Take 11	294.245	297.560	296.253	275.638	244.836	330.094	330.829	328.972	328.327	292.607	280.792	371.544	369.926	391.601	371.352	329.755	294.320	275.210	281.896	293.009
Take 12	293.874	294.689	296.263	277.724	246.897	333.955	329.218	329.423	327.179	292.738	279.114	371.598	369.434	387.587	368.091	329.302	292.659	275.672	280.358	290.912
Take 13	289.790	294.340	294.000	279.882	248.486	332.961	331.195	328.239	331.901	288.011	278.946	367.694	368.128	390.103	369.667	328.881	293.129	275.023	278.189	294.457
Take 14	293.406	298.024	296.223	280.945	244.446	328.268	328.013	332.957	330.207	292.006	282.228	372.073	367.755	384.237	368.096	326.058	293.356	272.839	273.391	287.091
Take 15	297.593	293.593	296.241	274.013	248.194	330.696	327.649	328.011	326.358	292.558	282.357	374.204	368.196	387.708	365.347	329.069	293.938	276.013	278.274	290.369
Take 16	295.640	295.165	294.788	277.551	246.586	330.966	329.311	328.502	326.292	291.236	277.010	371.114	367.929	391.397	379.367	323.695	293.331	279.120	279.559	292.289
Take 17	293.792	295.136	294.793	275.240	246.349	331.487	329.670	330.444	326.461	288.056	283.855	368.051	367.684	388.449	370.054	323.256	293.030	275.083	277.138	291.033
Take 18	294.541	294.799	295.669	275.730	243.605	331.912	327.869	330.006	326.946	290.026	283.784	371.129	367.568	386.643	367.441	331.357	295.221	268.472	274.204	286.705
Take 19	291.102	293.837	293.946	276.837	245.288	333.697	327.106	330.146	327.012	291.089	279.659	371.448	365.653	385.278	365.074	328.614	292.581	278.526	280.685	289.162
Take 20	291.455	295.474	289.253	277.174	241.815	326.905	331.414	330.537	328.292	289.737	268.684	371.218	366.076	389.770	362.990	325.273	291.553	274.137	274.140	285.089
Take 21	292.659	295.801	293.048	274.804	245.694	334.380	328.277	328.727	323.444	289.945	271.485	367.970	368.750	393.327	367.254	326.556	293.257	274.516	280.386	288.730
Alto 2 AVERAGE	293.451	296.016	295.148	277.534	247.110	331.346	329.022	329.565	327.861	291.586	278.361	370.810	368.413	388.195	367.974	328.912	293.806	276.326	278.002	290.758
Cents RF+3rds	-1.757	13.310	8.226	1.697	0.680	8.506	-3.681	-0.828	-9.799	-12.794	6.845	3.316	-7.914	-17.361	-9.975	-4.261	0.334	-5.854	4.614	-17.719
Cents RF-3rds	2.152	17.219	12.135	5.605	4.589	12.415	0.228	3.081	-5.890	-8.885	10.754	7.225	-4.005	-13.453	-6.066	-0.352	4.243	-1.946	8.523	-13.810
Just Int I	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Just Int II	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Pythagorean	0.000	0.000	0.000	9.775	5.865	3.910	3.910	3.910	3.910	0.000	9.775	7.820	7.820	-1.955	7.820	3.910	0.000	9.775	9.775	0.000
Meantone	0.000	0.000	0.000	-17.108	-10.264	-6.843	-6.843	-6.843	-6.843	0.000	-17.108	-13.686	-13.686	3.422	-13.686	-6.843	0.000	-17.108	-17.108	0.000
Take 01	295.953	295.142	296.101	279.686	251.238	334.010	331.571	334.323	329.901	296.648	281.436	379.167	373.917	394.653	371.999	334.832	296.856	279.969	282.375	295.606
Take 02																				
Take 03	295.089	294.434	296.850	281.141	250.544	332.856	332.876	334.474	331.220	297.458	281.727	377.666	372.817	393.681	377.019	326.066	296.721	279.877	281.501	295.053
Take 04	295.705	294.327	294.168	280.470	248.510	322.969	331.749	331.505	333.081	296.613	282.692	372.318	372.372	395.275	381.064	325.630	296.208	280.530	283.826	297.839
Take 05																				
Take 06	293.892	291.122	294.509	281.631	250.169	333.148	329.889	327.947	327.020	295.450	281.057	373.754	371.506	389.568	376.305	330.281	293.752	279.310	280.997	293.540
Take 07	296.772	294.377	294.905	279.709	248.561	332.536	331.185	332.361	330.117	291.565	275.175	372.587	370.949	391.762	375.775	328.628	294.669	281.458	281.738	295.333
Take 08	295.848	294.604	295.309	279.535	248.970	335.418	330.136	330.595	328.167	292.852	280.584	371.272	372.643	394.325	372.788	329.244	294.356	281.052	282.275	296.233
Take 09	295.508	295.753	295.607	279.980	247.989	330.138	330.864	328.404	325.939	290.494	280.917	375.540	373.344	395.941	376.112	330.021	295.551	279.852	280.463	295.015
Take 10	295.592	296.089	296.441	280.935	246.369	333.947	332.328	333.124	330.034	296.457	280.039	375.723	372.760	395.582	370.654	336.920	296.276	279.631	278.547	293.894
Take 11	296.356	296.700	296.661	280.440	248.977	333.122	333.266	332.491	335.134	301.585	289.920	371.463	375.312	395.636	375.120	331.555	297.648	279.874	280.584	297.834
Take 12	295.901	296.287	297.082	278.633	247.428	334.234	329.183	333.673	332.040	297.330	282.990	370.257	374.627	397.810	375.073	330.374	297.315	279.288	281.479	296.360
Take 13	296.777	295.738	295.272	282.428	251.172	334.332	332.675	332.941	329.083	296.632	282.090	372.041	374.592	397.496	376.306	332.393	295.766	279.049	280.822	295.031
Take 14	292.821	292.153	291.242	277.406	248.678	329.350	329.306	333.501	326.597	298.192	282.119	374.894	370.462	397.362	369.898	330.150	293.953	277.111	278.035	295.499
Take 15	293.052	291.757	292.331	279.127	246.774	334.311	327.683	334.758	330.690	298.068	283.853	316.697	371.351	394.200	372.807	324.437	293.655	277.912	277.885	296.786
Take 16	295.227	293.433	294.419	277.847	246.885	332.595	329.913	330.705	329.818	295.365	278.557	377.361	372.348	393.791	378.631	333.793	293.148	278.381	279.528	294.822
Take 17	292.555	295.228	294.961	278.947	248.392	331.958	330.963	328.332	327.672	294.062	278.592	371.747	371.614	389.415	375.891	325.076	293.758	277.428	281.959	294.616
Take 18	293.710	293.635	296.048	278.244	246.022	332.052	329.054	328.764	328.553	294.389	281.620	0.000	369.022	388.438	374.579	332.936	294.764	279.934	275.700	292.871
Take 19	293.311	293.857	294.249	279.065	243.291	327.978	329.386	331.599	331.375	294.860	276.045	369.887	370.612	390.565	373.443	332.396	294.005	277.824	278.058	293.642
Take 20	295.999	296.443	296.015	279.327	250.227	331.268	330.829	330.789	334.047	298.567	281.353	372.798	373.422	390.315	375.508	329.614	295.514	279.429	283.304	295.866

Take 21	295.052	292.488	297.404	280.355	246.309	330.839	331.737	331.666	332.126	298.700	280.381	375.350	371.407	397.672	377.405	336.015	295.443	278.226	282.105	294.682
Alto 3 AVERAGE	**295.006**	**294.398**	**295.241**	**279.732**	**248.237**	**331.951**	**330.768**	**331.682**	**330.138**	**296.068**	**281.113**	**373.754**	**372.372**	**393.868**	**375.072**	**330.545**	**295.229**	**279.270**	**280.588**	**295.291**
Cents RF+3rds	7.393	3.822	8.769	15.352	8.562	11.661	5.482	10.258	2.179	13.611	23.879	17.008	10.595	7.752	23.102	4.317	8.702	12.494	20.645	9.062
Cents RF-3rds	11.302	7.730	12.678	19.261	12.470	15.570	9.391	14.166	6.088	17.520	27.787	20.916	14.503	11.661	27.011	8.226	12.611	16.402	24.554	12.971
Just Int I	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Just Int II	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Pythagorean	0.000	0.000	0.000	9.775	5.865	3.910	3.910	3.910	3.910	0.000	9.775	7.820	7.820	-1.955	7.820	3.910	0.000	9.775	9.775	0.000
Meantone	0.000	0.000	0.000	-17.108	-10.264	-6.843	-6.843	-6.843	-6.843	0.000	-17.108	-13.686	-13.686	3.422	-13.686	-6.843	0.000	-17.108	-17.108	0.000
Take 01	292.704	292.175	290.295	277.290	246.984	332.987	327.447	327.704	329.012	292.338	276.621	367.883	369.834	390.773	370.449	327.792	290.426	279.487	274.924	290.915
Take 02																				
Take 03	293.699	292.053	292.127	274.453	245.229	330.755	328.712	327.988	328.574	288.881	273.834	367.625	371.035	391.464	368.052	327.800	291.514	276.485	275.695	289.763
Take 04	293.938	293.283	292.907	273.833	246.809	330.521	329.539	327.491	326.540	291.281	274.089	367.899	371.994	393.469	370.922	325.527	291.434	275.904	277.485	291.664
Take 05																				
Take 06	292.008	293.392	291.122	277.083	246.600	330.208	327.888	325.950	325.886	290.545	278.754	366.998	368.952	387.077	368.399	324.024	290.026	275.583	273.995	288.048
Take 07	292.892	292.221	291.580	276.798	245.217	329.530	328.888	329.672	326.651	292.501	276.778	366.679	371.262	390.783	369.849	327.829	291.289	275.294	277.408	292.985
Take 08	294.623	293.932	293.681	277.444	246.979	332.583	328.891	329.942	325.443	292.812	282.491	369.290	371.664	392.261	368.785	325.688	291.441	275.158	277.851	291.826
Take 09	293.023	294.523	293.447	276.765	247.561	331.732	329.227	328.614	327.090	291.458	274.181	369.468	371.901	390.784	368.707	326.024	290.712	274.987	276.091	292.219
Take 10	292.371	292.834	291.932	278.526	253.119	329.569	326.979	328.894	333.184	294.121	277.358	366.664	369.702	389.134	370.614	325.511	290.792	276.589	278.147	292.774
Take 11	294.520	293.441	294.152	274.262	249.209	330.820	328.873	328.072	328.797	290.799	276.438	370.915	371.015	389.281	374.820	329.007	291.663	275.581	276.108	293.207
Take 12	293.127	295.590	293.764	274.822	245.059	329.554	328.875	327.574	327.359	290.346	277.359	363.614	371.381	391.441	368.515	324.072	290.510	276.971	281.232	291.171
Take 13	291.633	292.216	292.381	277.174	245.960	328.230	328.891	332.339	330.367	290.776	280.664	368.213	370.656	395.256	373.231	327.651	291.736	275.996	275.857	292.489
Take 14	292.722	293.614	290.507	277.019	244.604	329.398	328.809	326.875	326.575	291.910	273.027	366.654	369.281	390.328	369.559	323.912	290.872	274.800	274.960	290.751
Take 15	292.984	293.261	291.473	276.806	247.667	328.532	326.790	327.935	325.089	289.120	277.450	368.996	368.826	392.623	367.957	322.863	290.169	274.543	275.681	290.110
Take 16	292.224	292.332	291.457	276.405	244.790	332.897	328.372	330.281	327.567	292.929	276.140	371.414	368.238	389.773	367.782	324.925	291.458	274.461	275.843	292.302
Take 17	292.868	293.374	291.979	274.993	245.038	330.485	327.234	327.983	325.647	290.510	276.716	368.252	369.114	388.648	370.512	328.254	290.684	273.863	274.692	292.098
Take 18	293.034	291.357	289.881	276.025	243.267	330.356	327.804	323.832	326.896	292.445	270.392	367.123	368.755	388.851	372.657	323.868	291.035	274.980	275.669	289.267
Take 19	292.002	292.986	293.549	275.494	242.654	330.111	326.768	327.600	325.965	288.677	278.065	373.569	369.471	389.204	369.440	325.906	290.482	274.222	275.685	290.994
Take 20	290.973	290.884	290.538	275.672	246.245	329.525	328.522	326.938	324.407	291.612	281.603	374.119	368.501	390.005	368.359	325.940	291.126	276.029	276.417	291.185
Take 21	293.927	295.592	294.534	276.359	245.435	332.460	331.283	327.611	328.026	288.578	274.902	370.682	370.022	391.588	368.324	327.555	290.904	274.382	273.891	290.439
Alto 4 AVERAGE	**292.909**	**293.108**	**292.174**	**276.170**	**246.233**	**330.540**	**328.410**	**328.068**	**327.320**	**291.139**	**276.677**	**368.740**	**370.084**	**390.671**	**369.839**	**326.008**	**290.962**	**275.543**	**276.191**	**291.274**
Cents RF+3rds	-4.958	-3.780	-9.308	-6.835	-5.473	4.286	-6.903	-8.706	-12.660	-15.452	-3.659	-6.377	-0.076	-6.357	-1.225	-19.614	-16.506	-10.769	-6.701	-14.648
Cents RF-3rds	-1.049	0.129	-5.399	-2.926	-1.564	8.195	-2.994	-4.798	-8.752	-11.543	0.250	-2.468	3.833	-2.449	2.683	-15.705	-12.597	-6.860	-2.792	-10.739
Just Int I	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Just Int II	0.000	0.000	0.000	-11.731	-15.641	-17.596	-17.596	3.910	3.910	0.000	-11.731	-13.686	-13.686	-1.955	-13.686	3.910	0.000	-11.731	-11.731	0.000
Pythagorean	0.000	0.000	0.000	9.775	5.865	3.910	3.910	3.910	3.910	0.000	9.775	7.820	7.820	-1.955	7.820	3.910	0.000	9.775	9.775	0.000
Meantone	0.000	0.000	0.000	-17.108	-10.264	-6.843	-6.843	-6.843	-6.843	0.000	-17.108	-13.686	-13.686	3.422	-13.686	-6.843	0.000	-17.108	-17.108	0.000

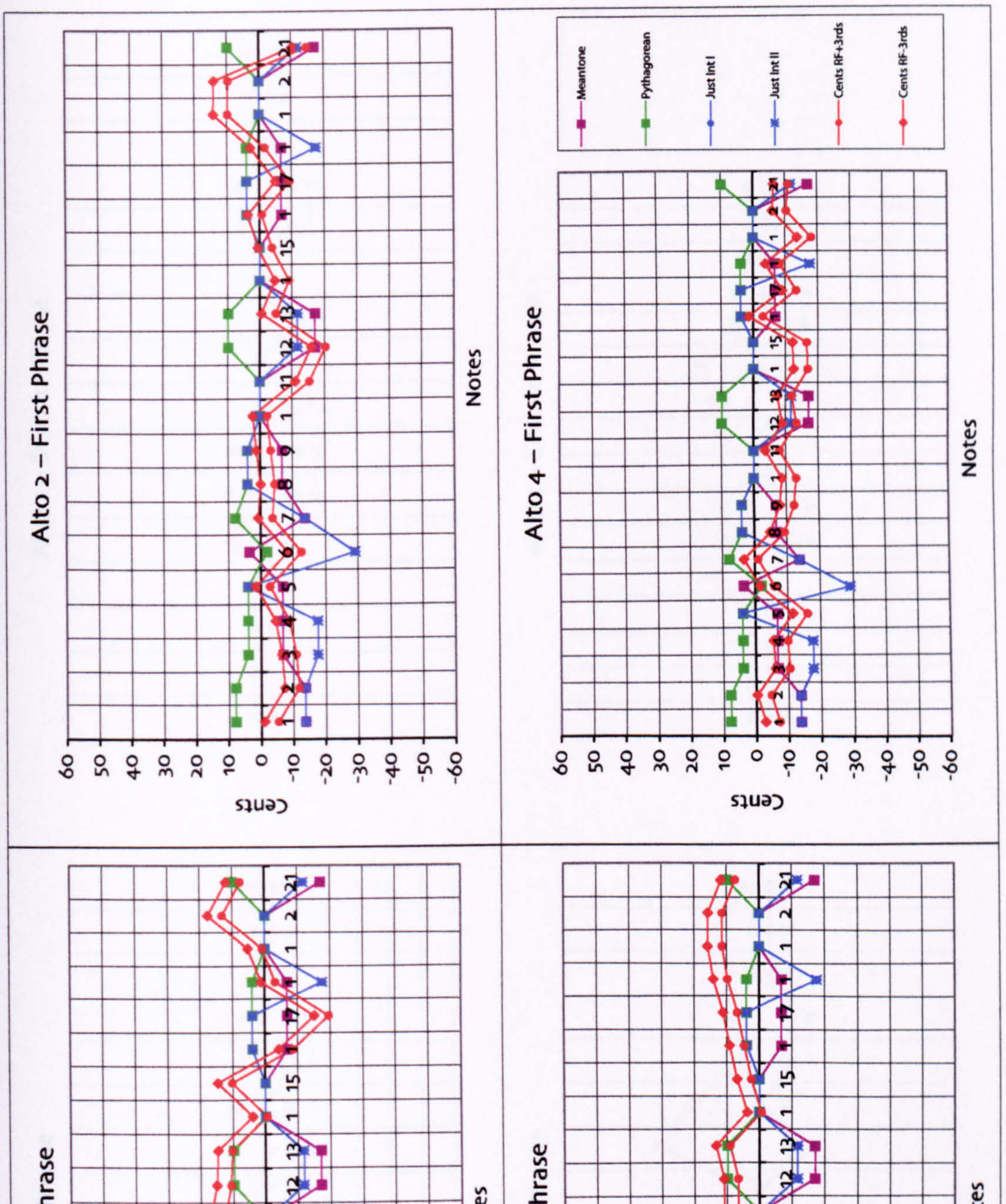
Fifth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16
Take 01	369.938	389.420	369.509	329.878	297.038	279.012	296.449	294.620	297.396	282.946	283.442	295.303				
Take 02																
Take 03	368.157	384.057	366.046	328.412	295.441	279.087	295.500	298.566	293.679	276.853	279.626	294.484				
Take 04	369.981	387.770	365.814	330.442	295.766	280.459	304.972	299.521	295.215	279.988	280.259	295.676				
Take 05																
Take 06	368.517	391.357	372.867	334.407	303.049	280.054	299.267	296.821	297.630	280.767	280.620	294.123				
Take 07	371.325	387.282	368.767	330.636	296.395	278.079	297.496	299.699	297.527	279.082	277.141	294.445				
Take 08	375.597	388.461	370.308	331.361	294.096	276.654	299.296	300.244	293.273	279.768	280.875	294.034				
Take 09	371.846	392.274	370.744	333.329	293.780	271.214	295.804	298.440	295.724	278.555	278.236	293.549				
Take 10	373.729	389.401	372.821	329.675	302.320	276.047	297.929	296.257	295.735	280.503	280.045	295.848				
Take 11	372.339	389.335	371.103	332.291	296.939	282.218	300.049	296.092	297.133	283.235	281.803	296.141				
Take 12	372.087	392.048	368.806	331.150	291.057	282.186	300.000	299.188	296.555	279.420	278.156	295.513				
Take 13	373.355	392.652	374.139	333.531	295.597	272.033	294.849	301.082	297.798	275.844	276.190	294.983				
Take 14	366.564	385.314	362.364	328.518	290.450	277.121	297.133	295.503	294.461	276.426	276.915	293.128				
Take 15	370.164	391.033	370.969	331.116	292.894	278.063	295.576	299.962	295.825	277.404	278.894	294.365				
Take 16	368.137	391.588	371.618	328.971	290.203	275.328	295.240	293.381	295.288	279.488	276.362	291.217				

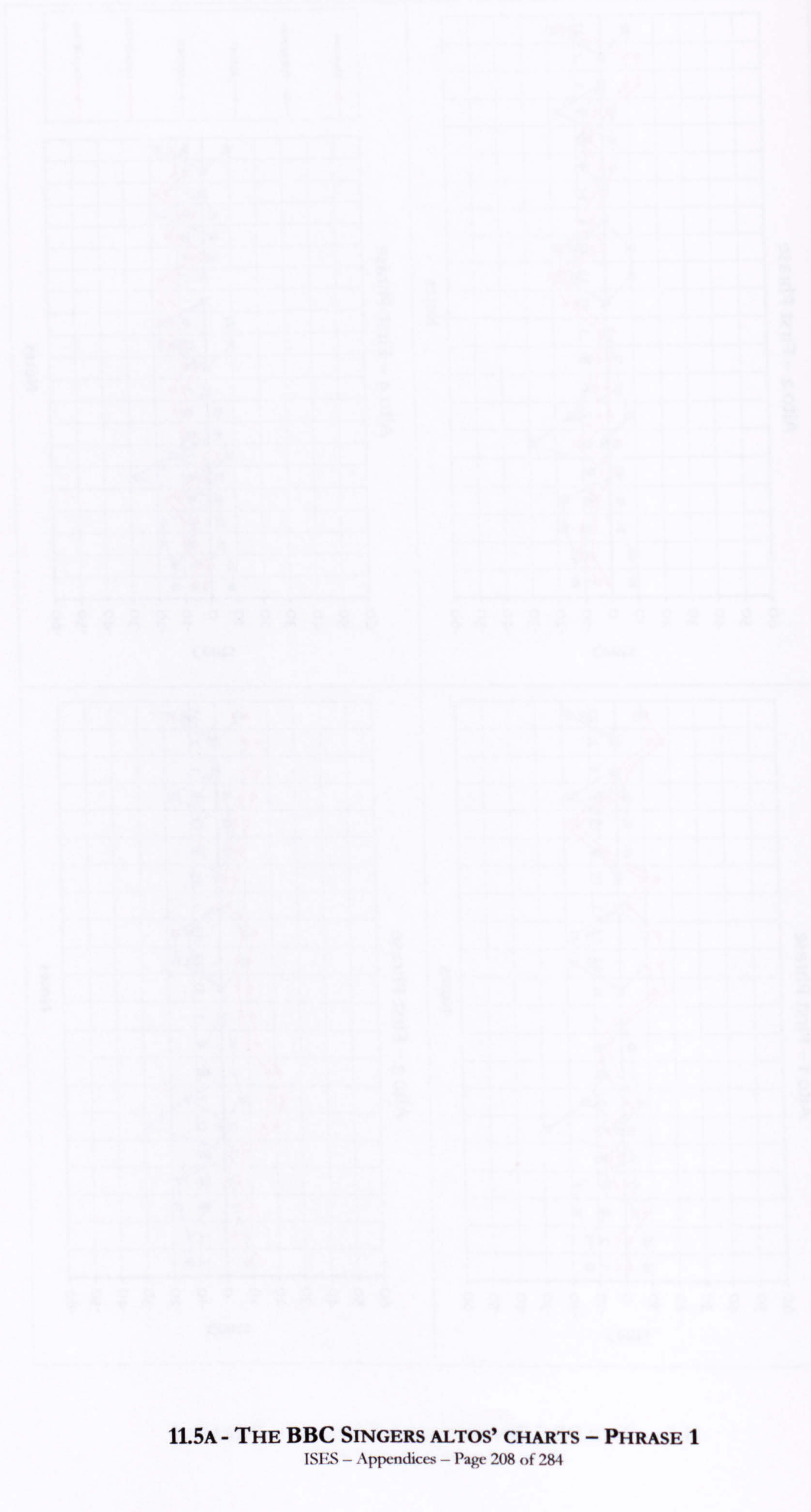
Take 17	370.643	391.139	373.165	330.215	289.822	278.233	297.391	295.860	293.875	277.007	275.094	293.682
Take 18	371.699	391.083	372.518	330.159	292.621	275.851	296.030	289.920	293.706	276.859	277.208	291.435
Take 19	371.321	388.899	368.626	327.600	292.085	276.477	297.170	290.823	293.725	278.921	275.743	293.263
Take 20	369.264	387.221	366.376	327.871	294.218	271.385	298.566	296.381	293.793	280.129	280.217	293.887
Take 21	373.151	390.769	371.805	328.808	288.028	275.217	298.843	296.524	294.840	276.558	281.208	294.271
Alto 1 AVERAGE	**370.937**	**389.532**	**369.914**	**330.440**	**294.305**	**277.090**	**297.766**	**296.783**	**295.430**	**278.934**	**278.844**	**294.176**
Cents RF+3rds	0.320	-15.002	-4.464	0.177	-0.315	-4.664	19.926	14.201	6.291	6.820	6.258	-1.075
Cents RF-3rds	0.805	-14.517	-3.979	0.662	0.169	-4.179	20.411	14.686	6.776	7.305	6.743	-0.590
Just Int I	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000
Just Int II	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	7.820	-1.955	7.820	3.910	0.000	9.775	0.000	0.000	0.000	9.775	9.775	0.000
Meantone	-13.686	3.422	-13.686	-6.843	0.000	-17.108	0.000	0.000	0.000	-17.108	-17.108	0.000
Take 01	372.658	395.927	371.309	331.827	288.643	269.500	304.293	304.197	296.107	278.927	280.967	295.068
Take 02												
Take 03	369.038	389.527	368.739	331.319	294.262	275.342	296.053	296.588	294.866	276.413	278.832	295.172
Take 04	367.782	391.476	370.568	331.086	293.822	278.599	300.155	294.058	294.813	278.190	282.505	293.386
Take 05												
Take 06	370.973	388.903	369.869	329.414	293.292	274.766	296.482	297.710	293.553	275.923	280.181	293.084
Take 07	370.781	390.373	368.723	329.843	294.000	279.958	297.125	295.307	295.041	276.253	278.332	292.264
Take 08	371.762	393.085	371.431	331.759	290.777	279.176	298.591	295.681	295.837	275.136	279.287	293.099
Take 09	375.094	393.493	369.980	328.829	291.316	278.768	290.301	294.795	292.304	274.630	276.014	293.290
Take 10	372.511	393.191	369.207	331.642	293.534	281.867	295.620	296.888	294.705	276.129	278.456	295.324
Take 11	375.329	396.861	370.616	331.070	295.290	284.705	294.604	297.357	297.111	275.097	278.533	297.225
Take 12	367.966	385.872	364.277	328.209	287.884	276.815	291.089	294.429	297.154	275.503	280.667	293.295
Take 13	372.660	393.709	368.626	329.615	294.258	278.475	294.087	296.401	295.923	272.853	276.598	293.265
Take 14	370.328	389.510	369.486	327.797	288.619	273.481	290.886	293.637	293.277	272.702	276.900	291.189
Take 15	369.859	390.566	369.576	329.569	285.920	278.423	294.491	290.991	293.200	275.028	277.032	292.152
Take 16	369.361	389.954	365.614	330.283	293.055	275.296	298.983	293.920	293.182	272.669	277.207	291.209
Take 17	373.281	393.694	366.717	330.256	289.529	278.975	289.558	295.857	295.406	273.349	277.358	295.344
Take 18	367.196	390.194	365.980	329.210	291.459	281.323	295.157	292.029	293.640	275.356	275.052	292.373
Take 19	370.589	389.671	367.527	329.004	291.347	276.984	298.526	293.410	292.363	275.410	274.292	291.970
Take 20	374.642	390.375	369.085	327.628	287.775	280.162	295.973	292.164	293.051	276.237	278.161	290.903
Take 21	370.020	389.307	368.011	329.427	292.762	279.114	298.223	294.651	291.849	275.964	279.014	291.734
Alto 2 AVERAGE	**371.149**	**391.352**	**368.702**	**329.884**	**291.450**	**277.986**	**295.328**	**294.771**	**294.389**	**275.356**	**278.178**	**293.229**
Cents RF+3rds	1.307	-6.931	-10.144	-2.743	-17.195	0.922	5.691	2.422	0.175	-15.532	2.121	-6.660
Cents RF-3rds	1.792	-6.446	-9.659	-2.258	-16.710	1.407	6.176	2.907	0.660	-15.047	2.606	-6.175
Just Int I	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000
Just Int II	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	7.820	-1.955	7.820	3.910	0.000	9.775	0.000	0.000	0.000	9.775	9.775	0.000
Meantone	-13.686	3.422	-13.686	-6.843	0.000	-17.108	0.000	0.000	0.000	-17.108	-17.108	0.000
Take 01	374.669	395.988	375.284	334.348	300.547	284.170	295.117	297.718	297.159	282.464	282.944	299.536
Take 02												
Take 03	374.787	395.055	371.344	332.595	297.076	281.115	298.556	296.581	297.100	281.323	283.157	299.316
Take 04	376.152	394.444	371.459	332.697	299.191	281.359	297.857	296.764	298.612	283.150	281.077	298.236
Take 05												
Take 06	374.852	391.993	371.292	332.057	295.916	280.691	295.313	295.375	295.437	279.898	283.945	295.011
Take 07	373.577	393.706	371.820	331.762	294.000	281.767	297.413	296.196	294.506	280.569	280.828	295.807
Take 08	377.997	396.847	372.580	332.423	293.775	282.125	299.267	296.207	295.935	283.771	282.122	295.275
Take 09	375.380	391.740	372.246	331.382	292.996	276.980	294.041	295.458	295.306	281.228	279.613	295.990
Take 10	373.808	389.893	370.374	332.620	298.921	282.038	290.483	297.698	295.304	280.976	281.600	295.859
Take 11	374.788	397.665	372.512	335.284	301.343	284.181	297.683	298.481	296.871	283.192	284.506	298.464
Take 12	379.458	395.951	374.867	334.042	295.211	282.396	297.497	297.368	296.732	281.775	282.272	296.554
Take 13	375.038	395.000	374.536	335.042	298.405	282.205	299.588	295.973	297.470	279.513	281.715	296.304
Take 14	373.632	387.707	369.207	329.512	292.244	276.446	292.274	295.720	293.404	279.833	280.905	293.859

Take 15	376.301	391.933	370.963	330.179	293.558	277.892	295.150	296.573	292.733	277.326	281.407	295.976
Take 16	374.109	393.642	370.932	330.986	298.331	280.088	294.991	297.392	295.008	278.373	281.485	294.772
Take 17	374.928	390.648	371.291	332.317	296.366	281.889	296.375	295.402	294.907	280.244	280.381	293.547
Take 18	375.946	391.793	369.131	330.750	295.230	279.758	289.930	293.585	293.874	278.047	280.280	295.796
Take 19	373.082	389.965	369.990	332.385	297.664	278.997	296.284	292.633	294.640	278.514	280.854	294.120
Take 20	379.968	399.805	380.225	332.968	297.137	283.479	294.699	295.283	295.248	278.911	280.738	293.701
Take 21	378.052	395.249	371.595	332.004	295.538	283.850	297.207	298.258	297.203	279.698	279.809	294.776
Alto 3 AVERAGE	**375.606**	**393.633**	**372.192**	**332.387**	**296.497**	**281.128**	**295.775**	**296.246**	**295.655**	**280.464**	**281.560**	**295.942**
Cents RF+3rds	21.975	3.130	6.166	10.346	12.532	20.380	8.308	11.061	7.608	16.285	23.039	9.287
Cents RF-3rds	22.460	3.615	6.650	10.831	13.016	20.865	8.793	11.546	8.093	16.770	23.524	9.772
Just Int I	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000
Just Int II	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	7.820	-1.955	7.820	3.910	0.000	9.775	0.000	0.000	0.000	9.775	9.775	0.000
Meantone	-13.686	3.422	-13.686	-6.843	0.000	-17.108	0.000	0.000	0.000	-17.108	-17.108	0.000
Take 01	372.101	392.512	373.068	330.228	294.728	281.340	296.763	293.846	294.921	278.928	279.638	292.368
Take 02												
Take 03	371.396	390.901	372.824	329.153	291.744	278.886	295.537	293.384	294.086	278.461	277.315	291.870
Take 04	373.901	391.913	375.002	330.226	295.621	281.394	295.712	294.410	293.927	279.214	279.958	293.801
Take 05												
Take 06	370.783	393.007	371.173	330.421	291.020	274.236	291.579	295.532	294.773	276.343	276.609	292.224
Take 07	371.729	395.273	372.462	330.367	290.927	276.449	292.809	292.463	293.969	275.292	278.005	292.129
Take 08	377.218	393.714	371.182	330.129	291.000	276.903	295.223	296.185	293.064	277.346	276.595	294.401
Take 09	373.445	395.424	371.801	330.002	293.218	279.183	294.890	293.828	293.374	275.155	275.685	292.585
Take 10	374.212	392.658	372.231	328.586	294.226	279.576	297.344	293.710	294.134	275.778	279.332	293.986
Take 11	376.376	393.059	373.331	329.496	294.231	278.974	293.906	293.771	292.738	277.177	278.578	292.541
Take 12	371.632	393.339	373.963	329.891	292.290	273.510	294.572	294.527	294.205	277.853	276.792	291.840
Take 13	376.836	391.418	371.844	330.492	293.623	278.175	294.017	294.080	292.513	275.245	276.861	292.133
Take 14	368.825	389.841	367.518	329.290	290.356	276.961	293.087	293.358	292.824	277.880	274.462	290.961
Take 15	372.621	390.744	370.301	328.420	296.151	276.737	291.462	294.761	291.975	274.065	276.028	292.368
Take 16	370.326	392.162	371.007	328.736	291.738	273.913	293.855	291.341	291.840	276.048	275.793	291.493
Take 17	373.411	388.931	372.048	328.793	291.976	275.305	291.021	291.570	292.843	274.284	274.712	290.862
Take 18	372.291	390.542	366.754	326.190	290.648	276.018	294.376	291.300	291.309	274.164	274.021	291.675
Take 19	371.887	391.204	371.711	330.061	293.034	276.489	293.817	292.436	292.108	273.465	276.977	291.811
Take 20	373.185	389.589	369.671	329.003	291.462	277.002	290.350	295.130	293.765	275.384	274.453	291.586
Take 21	374.778	390.631	373.056	328.692	290.962	274.707	289.757	290.483	291.492	274.928	274.122	290.148
Alto 4 AVERAGE	**372.998**	**391.940**	**371.629**	**329.378**	**292.577**	**277.145**	**293.688**	**293.480**	**293.151**	**276.158**	**276.628**	**292.146**
Cents RF+3rds	9.908	-4.331	3.544	-5.400	-10.514	-4.321	-3.948	-5.178	-7.120	-10.495	-7.553	-13.062
Cents RF-3rds	10.393	-3.846	4.028	-4.915	-10.029	-3.836	-3.464	-4.693	-6.635	-10.011	-7.068	-12.577
Just Int I	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000
Just Int II	-13.686	-1.955	7.820	3.910	0.000	-11.731	0.000	0.000	0.000	-11.731	-11.731	0.000
Pythagorean	7.820	-1.955	7.820	3.910	0.000	9.775	0.000	0.000	0.000	9.775	9.775	0.000
Meantone	-13.686	3.422	-13.686	-6.843	0.000	-17.108	0.000	0.000	0.000	-17.108	-17.108	0.000

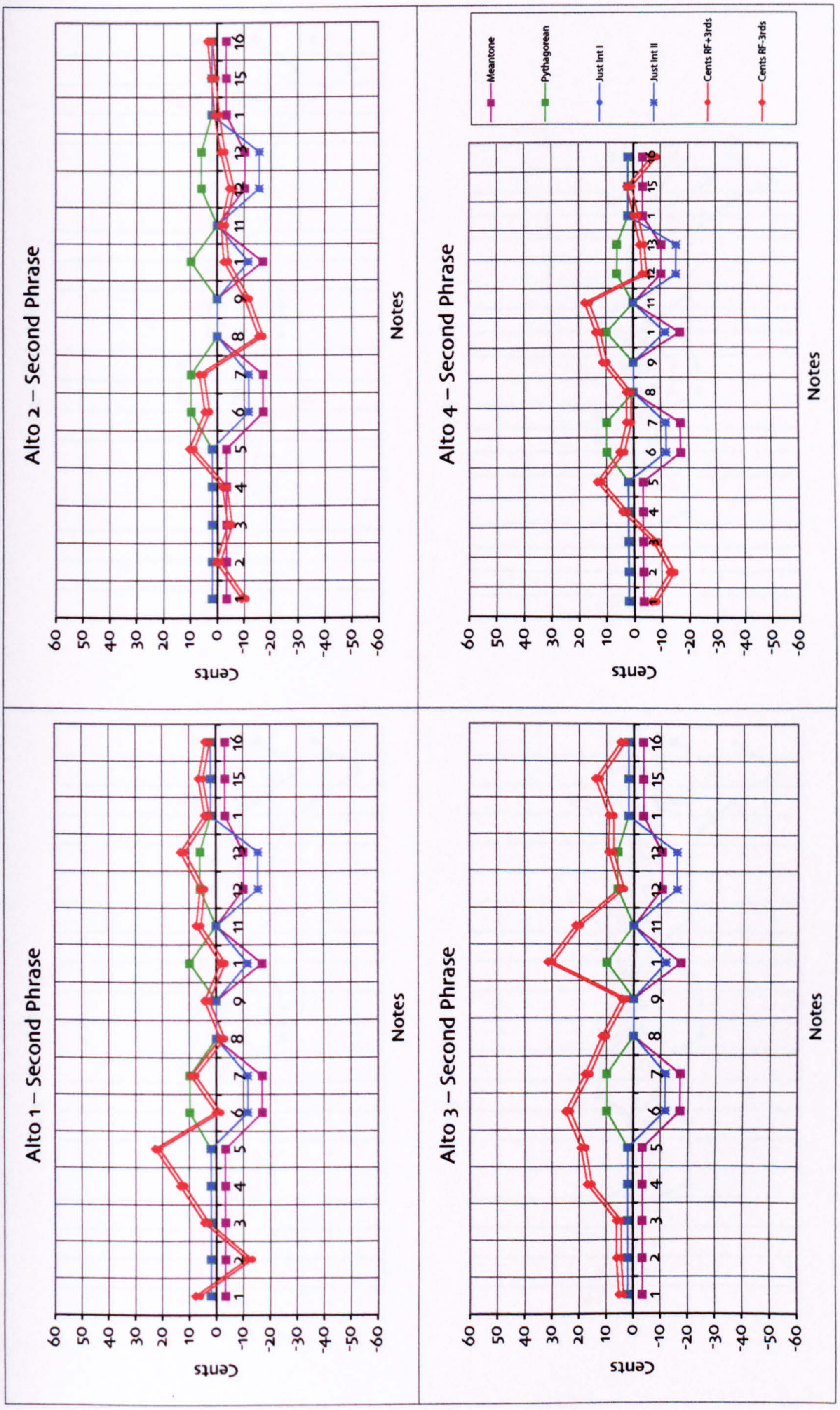
11.5 - THE BBC SINGERS ALTOS' RESULTS



11.5A - THE BBC SINGERS ALTOS' CHARTS – PHRASE 1

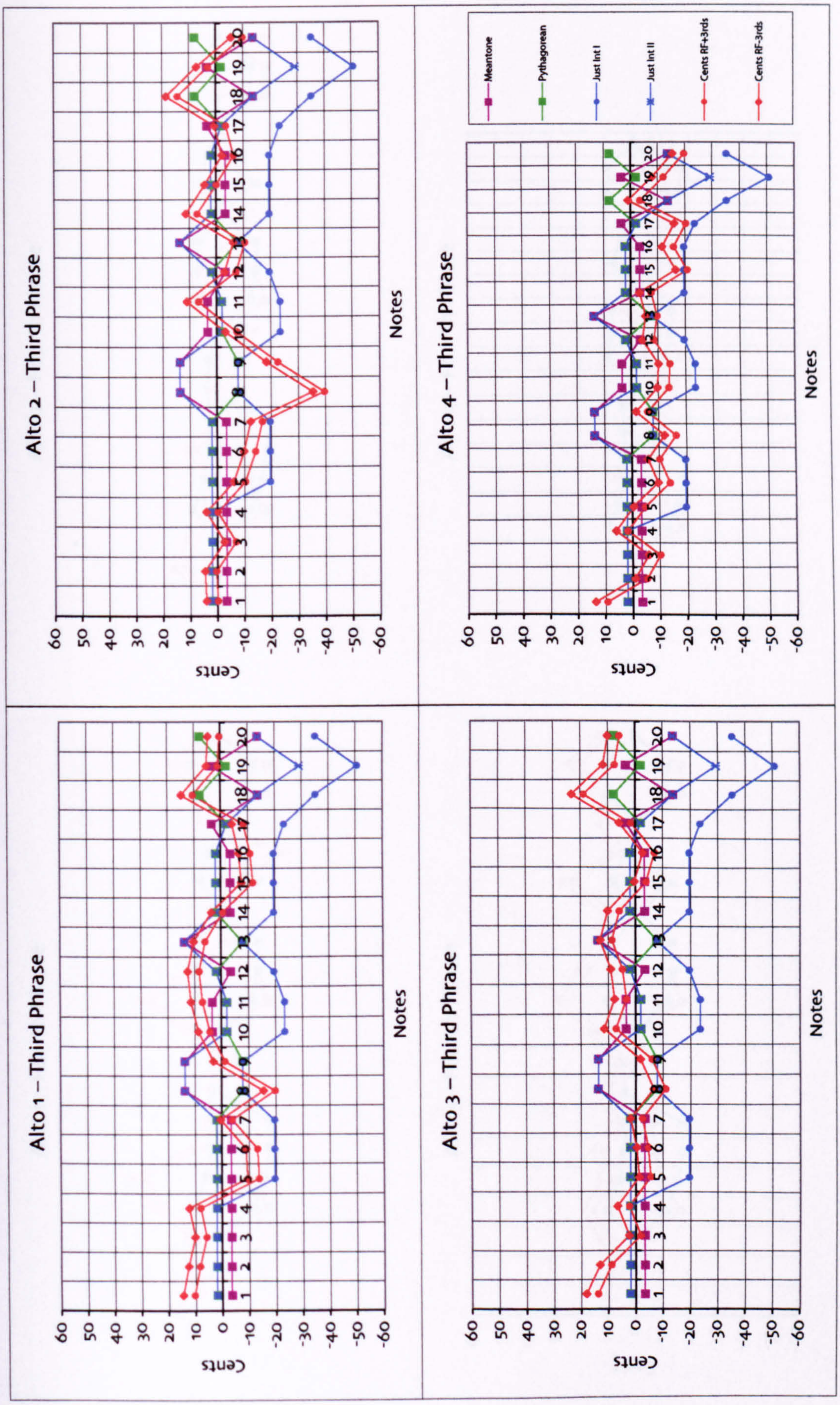


11.5A - THE BBC SINGERS ALTOS' CHARTS – PHRASE 1

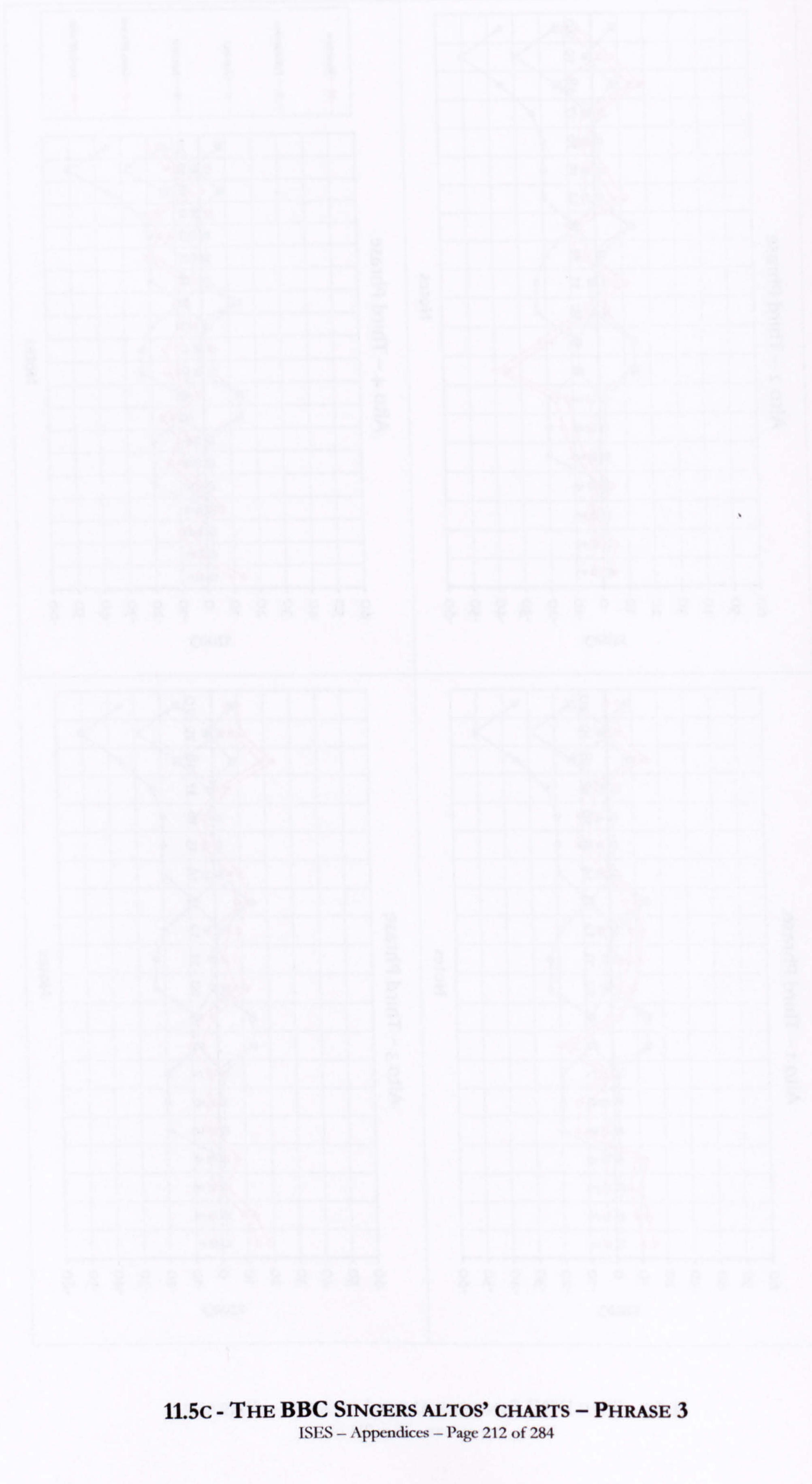


11.5B - THE BBC SINGERS ALTOS' CHARTS – PHRASE 2

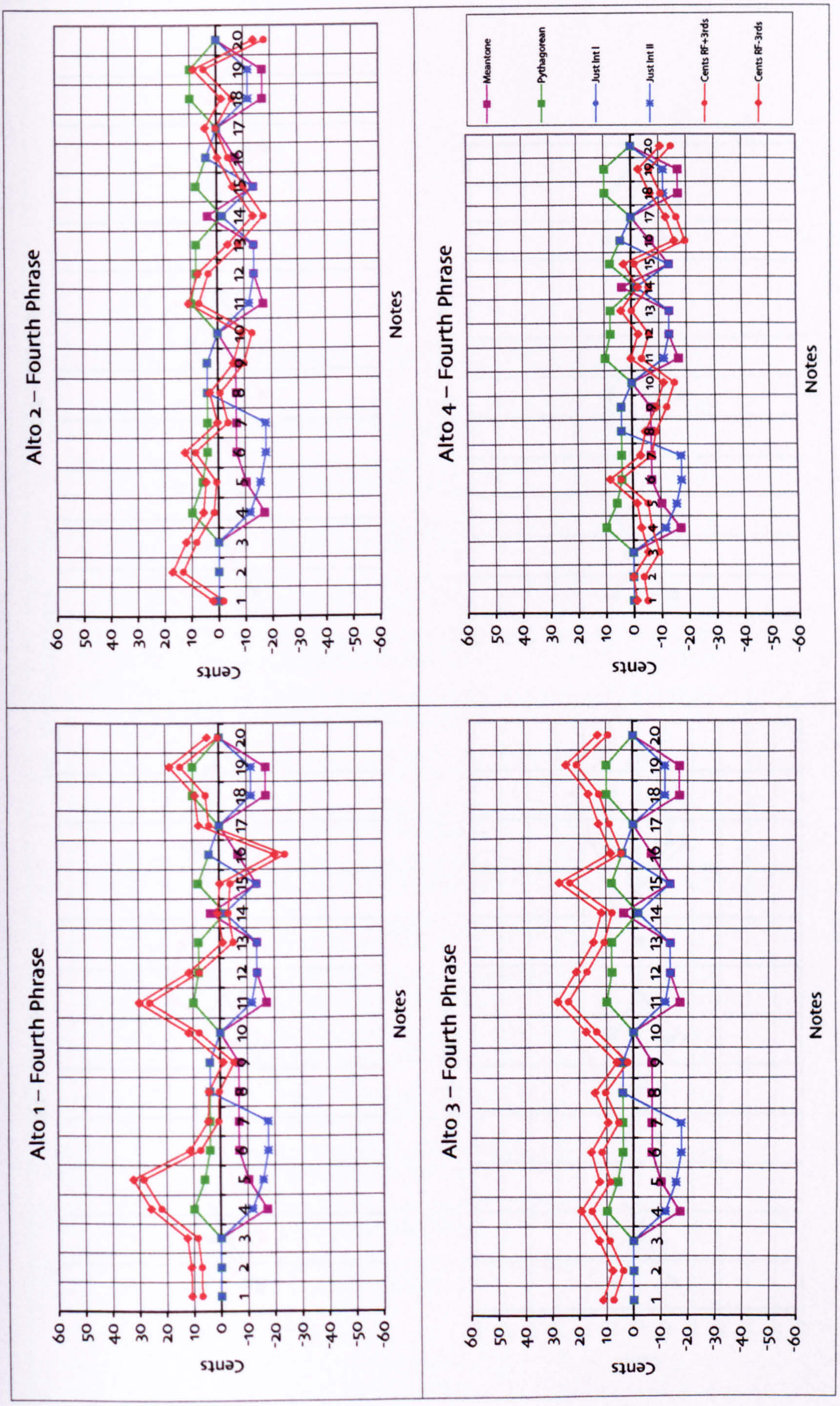
11.5B - THE BBC SINGERS ALTOS' CHARTS – PHRASE 2



11.5c - The BBC Singers altos' charts – Phrase 3

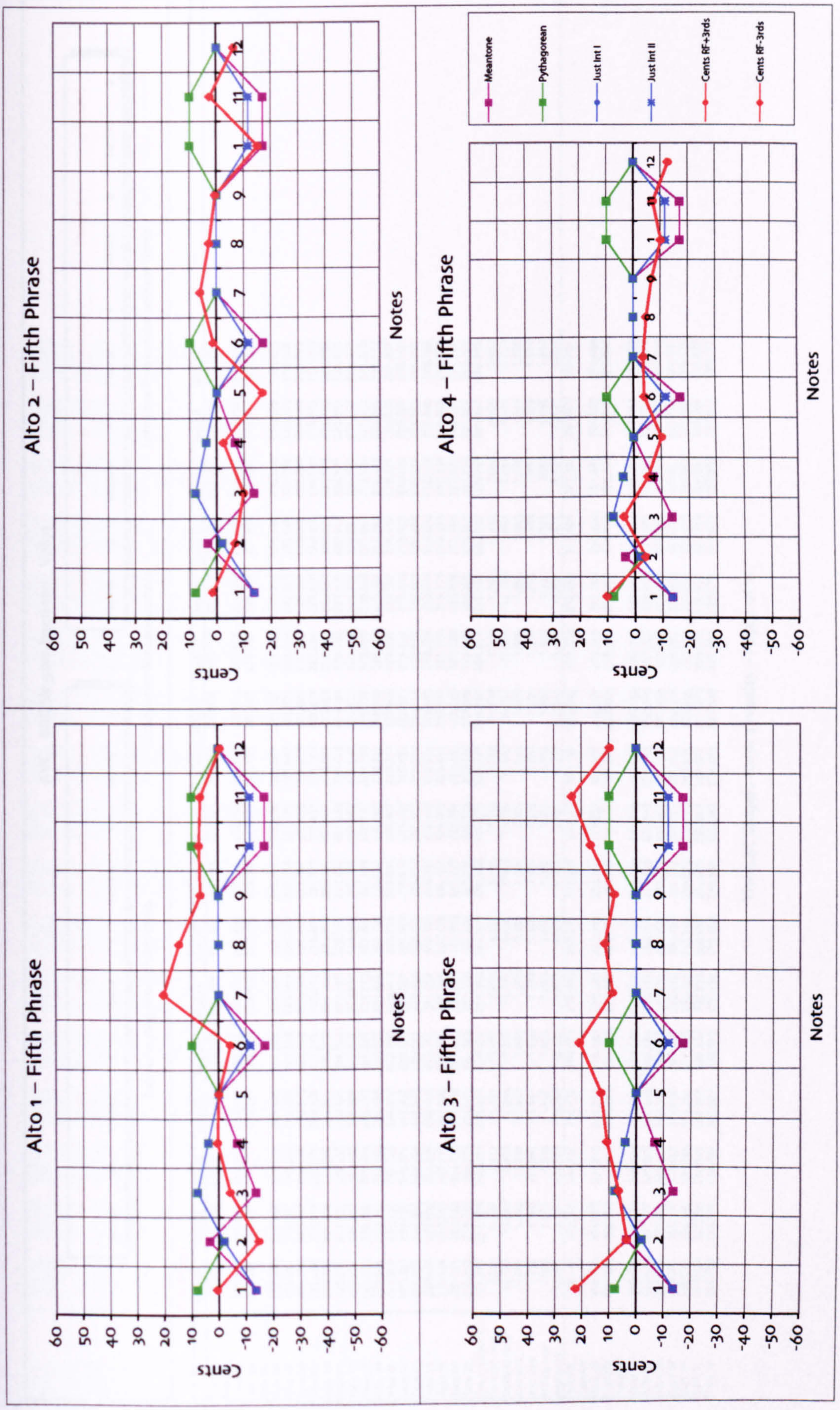


11.5c - The BBC Singers altos' charts – Phrase 3



11.5D - THE BBC SINGERS ALTOS' CHARTS – PHRASE 4

11.5D - THE BBC SINGERS ALTOS' CHARTS – PHRASE 4



11.5E - THE BBC SINGERS ALTOS' CHARTS – PHRASE 5

11.5E - THE BBC SINGERS ALTOS' CHARTS – PHRASE 5

AVC _ BBC Singers Sections _ Voice

Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
147.030	D	110.057	A	110.428	A	146.875	D	147.179	D

Reference Frequencies with Thirds

Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
146.658	D	109.949	A	110.156	A	146.543	D	147.138	D

Reference Frequencies without Thirds

Frequency Measurements

First Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17
Take 01	220.903	221.400	247.049	246.542	222.189	222.004	221.921	220.073	223.111	223.875	222.431	222.777	222.607	221.634	221.383	220.903	221.704
Take 02																	
Take 03	219.139	218.669	244.873	244.987	220.372	219.870	220.402	220.340	222.230	220.310	222.086	222.429	221.064	221.118	219.661	220.796	220.490
Take 04	220.327	221.791	243.913	246.197	222.676	222.440	222.476	222.943	223.311	222.195	222.553	223.002	223.166	221.918	222.047	222.577	221.802
Take 05																	
Take 06	222.920	219.566	245.167	245.489	221.268	221.584	221.140	219.540	220.690	220.862	221.989	222.166	221.796	220.582	220.642	219.929	220.325
Take 07	222.007	224.967	246.362	245.530	221.310	220.964	220.819	220.118	221.527	221.028	222.823	221.964	222.619	220.649	220.786	222.236	219.806
Take 08	223.237	225.131	248.276	246.348	223.543	223.060	222.248	221.267	222.123	223.358	221.820	222.101	223.547	220.063	222.635	222.592	220.613
Take 09	221.274	218.817	245.076	244.329	221.745	222.016	219.897	222.271	221.611	222.303	222.877	222.250	222.280	220.510	220.920	219.243	221.470
Take 10	220.227	219.806	247.223	244.096	220.516	221.309	220.810	220.621	221.431	218.891	221.998	220.747	219.127	220.679	220.190	220.769	221.193
Take 11	225.756	222.826	248.833	248.424	224.352	225.422	222.031	222.232	224.258	223.412	224.186	223.153	221.670	220.916	222.971	223.351	222.352
Take 12	220.382	221.327	245.986	246.504	221.937	219.684	219.846	220.701	221.962	222.347	221.539	220.616	221.102	220.821	221.793	221.257	221.341
Take 13	223.985	226.406	249.404	246.125	223.254	222.743	221.887	221.526	222.741	222.765	222.737	222.999	222.828	221.867	221.197	221.142	221.316
Take 14	220.225	218.532	245.108	244.126	218.267	221.812	220.788	220.541	220.602	219.739	220.138	218.985	220.467	219.567	218.395	220.286	220.623
Take 15	221.900	220.536	247.728	246.928	222.260	220.914	219.735	219.661	220.407	218.317	222.800	222.066	222.507	218.419	219.271	219.379	221.381
Take 16	220.561	220.120	245.805	245.956	222.290	221.027	221.489	219.670	221.387	219.487	222.161	219.937	220.548	218.027	220.172	220.695	220.100
Take 17	221.091	220.862	245.724	245.633	220.141	219.438	220.459	220.010	220.219	219.377	220.566	218.854	218.803	220.419	220.214	219.968	219.001
Take 18	220.426	220.080	242.206	243.119	219.551	222.092	219.197	219.166	218.003	218.664	219.455	218.624	219.444	218.001	218.578	218.446	220.708
Take 19	219.398	220.393	247.713	247.453	221.803	220.259	220.178	220.925	221.273	221.042	223.514	221.294	219.179	219.598	220.334	218.930	219.628
Take 20	223.125	220.784	246.175	244.559	221.340	220.247	221.966	221.723	222.080	224.451	223.180	223.230	220.086	221.166	222.605	222.037	221.627
Take 21	218.656	219.329	245.771	244.145	221.525	221.530	221.209	221.271	220.924	220.784	222.809	221.566	219.202	218.517	221.119	221.627	219.480
Ten 1 AVERAGE	221.344	221.123	246.231	245.605	221.597	221.495	220.973	220.768	221.573	221.221	222.193	221.514	221.160	220.235	220.785	220.851	220.787
Cents RF+3rds	8.223	6.494	-7.311	-11.721	10.197	9.405	5.321	3.712	10.013	7.262	14.848	9.548	6.782	-0.472	3.842	4.358	3.863
Cents RF-3rds	12.599	10.870	-2.935	-7.345	14.573	13.781	9.697	8.088	14.389	11.638	19.224	13.924	11.159	3.904	8.218	8.734	8.239
Just Int I	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Just Int II	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Pythagorean	1.955	1.955	5.865	5.865	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955
Meantone	-3.421	-3.421	-10.264	-10.264	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421
Take 01	219.179	220.310	244.757	246.477	218.689	218.910	219.777	221.908	220.138	220.190	220.060	222.134	219.464	219.665	221.531	220.500	219.781
Take 02																	
Take 03	216.779	221.022	246.312	245.611	219.884	220.380	219.515	220.184	219.932	222.996	218.027	218.979	222.104	218.820	221.342	222.809	219.884
Take 04	219.007	220.633	246.937	246.794	220.715	223.581	220.201	222.997	220.354	221.665	220.486	219.441	221.784	216.738	222.995	224.073	220.848
Take 05																	
Take 06	220.338	221.213	246.444	246.162	222.177	223.702	220.251	220.180	219.710	222.179	220.155	220.267	219.870	221.074	220.598	219.841	218.775
Take 07	223.063	221.722	245.603	246.243	222.264	220.174	222.600	221.619	220.147	220.743	222.446	221.506	222.220	218.681	221.293	221.822	220.810
Take 08	222.712	221.337	247.276	247.056	220.355	221.531	220.701	221.014	220.062	220.407	223.462	220.332	218.977	218.033	221.458	221.377	220.056
Take 09	220.967	220.530	248.657	248.800	222.260	219.972	220.794	221.112	221.726	221.563	223.350	221.881	223.809	221.719	223.627	223.227	221.234
Take 10	218.783	218.460	246.784	246.361	218.835	220.154	219.981	220.980	220.118	219.574	218.806	220.177	220.316	219.690	220.305	222.468	221.188
Take 11	221.030	221.690	248.919	247.844	220.356	222.653	220.657	221.629	222.667	223.072	221.275	219.563	222.457	222.318	223.383	224.267	221.849
Take 12	219.230	222.199	248.264	246.027	219.918	220.759	218.405	219.100	221.949	219.384	221.966	221.462	222.571	217.833	220.996	221.677	220.775

Take 13	221.042	221.753	246.701	246.233	219.233	220.474	219.726	221.428	219.717	220.928	219.070	222.266	224.161	221.088	222.846	222.545	220.283
Take 14	221.897	220.044	244.201	246.192	220.663	219.196	220.976	221.650	219.107	220.056	220.039	221.337	220.236	218.141	219.492	219.422	220.050
Take 15	218.213	219.744	245.608	246.972	220.089	221.254	220.527	221.180	218.861	222.577	220.684	221.568	223.846	220.105	221.811	221.490	218.879
Take 16	219.527	220.169	247.618	245.609	218.321	220.644	217.555	219.734	217.717	220.247	218.774	218.807	219.463	220.813	220.876	219.860	219.131
Take 17	218.782	218.276	243.657	244.267	218.597	219.508	218.633	219.810	218.508	217.506	219.942	219.755	218.410	221.337	220.029	221.963	219.511
Take 18	217.438	220.561	243.702	245.058	221.218	220.091	219.683	216.903	221.625	220.751	220.418	217.621	220.033	218.396	219.418	217.206	219.084
Take 19	217.682	219.403	248.369	246.483	220.564	219.494	219.463	219.298	218.702	220.833	219.889	222.142	218.427	219.413	220.381	219.955	219.147
Take 20	216.866	219.366	243.776	244.699	218.735	217.638	216.234	220.921	215.524	219.854	218.590	219.036	217.522	216.797	220.891	224.059	219.086
Take 21	220.118	222.197	245.800	245.277	219.728	220.608	221.279	220.690	220.871	222.011	219.441	220.103	221.852	219.821	221.580	223.302	219.989
Ten 2 AVERAGE	**219.613**	**220.559**	**246.283**	**246.219**	**220.137**	**220.564**	**219.840**	**220.649**	**219.865**	**220.870**	**220.362**	**220.441**	**220.922**	**219.499**	**221.308**	**221.677**	**220.019**
Cents RF+3rds	-5.368	2.073	-6.944	-7.395	-1.246	2.113	-3.583	2.780	-3.386	4.512	0.524	1.142	4.919	-6.269	7.940	10.823	-2.174
Cents RF-3rds	-0.992	6.449	-2.568	-3.019	3.130	6.489	0.793	7.156	0.990	8.888	4.900	5.519	9.295	-1.893	12.316	15.199	2.202
Just Int I	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Just Int II	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Pythagorean	1.955	1.955	5.865	5.865	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955
Meantone	-3.421	-3.421	-10.264	-10.264	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421
Take 01	216.264	215.797	242.558	242.094	217.342	216.634	218.026	217.868	216.904	217.760	217.659	220.486	219.177	219.826	220.853	218.686	217.391
Take 02																	
Take 03	216.674	213.667	243.609	240.792	217.465	217.104	217.501	217.185	217.851	217.964	217.436	220.146	219.391	218.370	218.482	219.722	217.421
Take 04	217.106	218.189	245.782	244.313	217.932	220.653	219.542	219.785	218.903	220.807	219.906	220.859	219.311	220.384	220.324	218.624	217.862
Take 05																	
Take 06	216.076	214.956	243.451	243.736	217.205	219.136	217.658	220.133	218.256	219.328	218.524	219.125	220.178	216.224	220.691	219.906	219.264
Take 07	222.394	220.670	247.299	244.410	217.625	220.072	221.851	225.138	220.154	219.426	220.247	220.005	220.182	220.071	220.182	219.183	220.633
Take 08	216.281	215.092	244.733	246.038	216.699	215.356	217.082	221.850	218.821	220.855	219.219	217.743	221.573	217.870	221.056	222.039	219.601
Take 09	217.972	219.760	246.801	247.970	219.964	219.867	219.989	225.095	220.739	223.383	223.364	222.349	225.122	220.157	220.482	218.298	219.813
Take 10	212.590	215.874	245.084	244.870	217.195	217.426	217.812	221.814	216.471	216.536	216.796	217.060	220.266	217.934	219.721	220.292	217.396
Take 11	219.106	216.255	247.105	245.402	217.636	219.307	219.548	221.755	220.029	217.655	218.924	222.233	218.985	220.769	221.913	221.047	220.929
Take 12	217.498	214.640	244.973	244.455	213.984	217.177	219.003	217.646	218.126	219.224	218.947	219.231	219.064	220.045	221.339	221.371	218.923
Take 13	218.296	218.099	245.728	245.225	216.937	219.379	218.449	222.277	220.115	223.004	219.219	217.567	221.201	218.642	220.121	222.108	220.373
Take 14	216.553	223.534	242.279	241.725	218.693	219.049	217.545	219.657	218.810	217.407	219.164	220.156	219.526	218.013	219.872	219.195	218.703
Take 15	217.473	214.526	243.555	241.885	217.198	218.490	218.048	218.594	219.182	219.585	217.080	219.455	220.016	219.574	218.871	217.444	216.468
Take 16	215.100	214.802	243.692	244.119	216.799	217.440	216.923	221.192	218.363	217.380	219.311	217.881	220.524	218.546	219.682	219.848	219.069
Take 17	212.322	212.665	244.981	243.307	216.131	218.218	217.033	220.813	217.296	217.241	218.872	218.465	222.123	214.796	219.898	218.806	217.926
Take 18	216.311	213.603	244.116	242.756	215.387	215.890	217.832	221.399	218.326	218.648	217.623	218.776	216.204	218.353	218.993	218.960	218.298
Take 19	218.414	214.817	244.836	243.393	215.925	216.247	217.280	217.178	217.773	217.025	216.536	216.265	218.013	216.714	219.523	218.194	216.177
Take 20	209.654	212.891	240.635	241.884	213.779	213.354	216.807	219.300	217.224	216.671	215.906	213.798	220.038	215.448	220.167	217.621	216.769
Take 21	217.932	214.888	245.891	243.638	216.362	218.124	217.363	218.714	217.910	218.946	216.855	217.783	220.437	216.140	218.879	218.343	217.866
Ten 3 AVERAGE	**216.527**	**216.038**	**244.585**	**243.790**	**216.856**	**217.838**	**218.173**	**220.389**	**218.487**	**218.887**	**218.505**	**218.915**	**220.070**	**218.309**	**220.055**	**219.457**	**218.467**
Cents RF+3rds	-29.871	-33.783	-18.926	-24.560	-27.246	-19.420	-16.757	0.737	-14.271	-11.107	-14.129	-10.882	-1.773	-15.680	-1.889	-6.599	-14.425
Cents RF-3rds	-25.495	-29.407	-14.550	-20.183	-22.870	-15.043	-12.381	5.113	-9.895	-6.731	-9.753	-6.506	2.603	-11.303	2.487	-2.223	-10.049
Just Int I	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Just Int II	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Pythagorean	1.955	1.955	5.865	5.865	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955
Meantone	-3.421	-3.421	-10.264	-10.264	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421
Take 01	216.880	218.863	244.729	244.891	217.620	221.418	221.187	221.823	219.891	218.994	219.078	219.031	221.520	221.531	222.469	221.142	219.472
Take 02																	
Take 03	221.417	219.033	245.167	245.988	219.749	218.920	220.296	220.046	220.438	218.975	219.026	220.708	220.376	220.037	221.932	222.311	220.204
Take 04	219.239	221.429	248.965	249.315	220.111	220.477	221.822	222.887	220.489	219.377	221.212	222.822	223.426	220.864	222.451	218.656	220.469
Take 05																	
Take 06	221.017	222.231	245.106	244.403	219.068	221.947	219.610	222.340	220.468	222.452	218.043	219.561	219.443	217.396	219.672	219.506	220.799
Take 07	221.747	219.885	247.212	246.653	220.561	219.282	219.813	222.303	221.337	221.846	219.458	220.073	222.874	219.624	223.229	222.505	221.702
Take 08	219.939	221.247	244.388	245.858	219.038	220.506	221.089	223.807	220.630	220.141	218.729	219.246	223.291	220.106	222.916	222.961	220.489
Take 09	221.302	219.457	248.887	250.542	220.585	223.060	222.086	224.864	222.839	221.909	221.483	220.848	223.153	221.571	223.094	223.372	221.535
Take 10	220.477	217.172	242.963	242.836	216.318	218.985	219.781	223.161	217.128	218.317	221.316	218.109	219.671	218.108	219.423	219.895	220.288

Take 11	221.003	221.403	248.722	247.595	221.027	221.257	220.719	222.763	220.661	223.388	220.528	221.955	223.374	222.336	223.543	222.727	221.011
Take 12	224.976	220.107	244.706	247.489	222.134	221.778	221.038	221.723	221.107	220.533	219.771	220.966	220.220	219.369	222.316	221.811	220.263
Take 13	221.379	222.799	245.502	249.682	222.223	221.682	222.169	225.224	220.458	220.022	219.656	218.807	223.417	218.787	221.841	221.387	221.413
Take 14	221.038	224.688	245.571	245.504	219.489	220.925	220.468	221.396	220.385	219.449	220.213	220.804	219.600	220.784	221.799	221.647	220.608
Take 15	219.903	219.255	243.800	244.096	218.502	217.663	218.792	221.782	219.499	219.137	218.891	219.982	222.783	218.704	221.309	221.608	220.425
Take 16	219.095	220.231	246.455	245.904	219.324	218.721	219.570	218.910	219.006	218.195	218.244	219.693	220.851	219.321	219.959	219.391	220.233
Take 17	220.500	219.958	246.519	245.254	221.133	218.755	218.921	219.397	219.343	217.651	219.563	219.910	221.879	217.162	220.856	221.774	219.300
Take 18	219.320	221.165	243.652	244.854	214.584	218.216	218.317	221.340	219.479	217.684	219.148	217.859	220.779	217.623	219.877	220.681	220.767
Take 19	220.486	219.304	247.658	246.951	219.897	218.820	221.454	220.275	219.988	219.859	218.350	219.092	221.811	219.431	221.635	221.415	220.288
Take 20	217.542	221.290	243.167	245.724	217.836	220.613	222.717	223.523	219.968	218.439	217.659	218.071	222.582	221.053	221.234	221.386	219.577
Take 21	225.049	221.043	246.006	246.201	220.710	220.917	221.225	222.426	219.567	220.185	218.349	219.828	224.285	220.875	222.716	220.638	220.714
Ten 4 AVERAGE	**220.648**	**220.556**	**245.746**	**246.302**	**219.469**	**220.208**	**220.583**	**222.105**	**220.141**	**219.819**	**219.406**	**219.861**	**221.860**	**219.720**	**221.699**	**221.306**	**220.503**
Cents RF+3rds	2.768	2.045	-10.725	-6.812	-6.508	-0.691	2.258	14.161	-1.213	-3.751	-7.002	-3.415	12.250	-4.527	10.992	7.924	1.631
Cents RF-3rds	7.144	6.421	-6.349	-2.436	-2.132	3.685	6.634	18.537	3.163	0.625	-2.626	0.961	16.626	-0.151	15.368	12.300	6.007
Just Int I	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Just Int II	1.995	1.995	-15.641	-15.641	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Pythagorean	1.955	1.955	5.865	5.865	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955
Meantone	-3.421	-3.421	-10.264	-10.264	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421	-3.421

Second Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17
Take 01	278.603	278.689	277.590	294.218	295.298	247.692	291.795	292.109	276.448	276.734	294.960	330.238	295.866	280.745	247.961	250.341	278.677
Take 02																	
Take 03	276.476	276.397	276.428	294.390	295.258	247.797	291.815	292.009	276.644	276.670	294.328	332.004	296.533	277.807	247.534	249.837	278.018
Take 04	279.267	278.939	277.184	293.118	291.334	246.562	292.774	292.780	276.870	271.783	294.940	330.750	294.952	278.545	248.849	248.537	277.167
Take 05																	
Take 06	275.958	276.527	276.174	291.916	294.036	246.131	288.668	288.455	274.708	274.986	293.527	331.571	290.298	274.938	246.215	247.582	275.057
Take 07	275.064	272.637	273.624	292.237	293.330	245.680	288.766	291.239	276.283	275.217	295.182	329.964	293.775	276.715	247.140	247.722	275.910
Take 08	276.286	277.979	277.196	292.396	294.040	246.744	291.480	289.211	275.885	277.417	294.961	331.911	292.092	275.118	246.776	247.630	276.599
Take 09	274.211	279.775	278.427	295.333	298.702	246.186	293.567	291.165	280.314	281.160	294.442	329.165	292.485	277.050	247.088	249.987	276.362
Take 10	276.737	277.329	277.485	292.661	295.645	247.413	291.060	292.845	276.370	275.102	291.667	328.681	294.235	278.137	247.437	249.768	278.216
Take 11	277.717	278.019	279.370	294.757	297.514	249.440	294.051	292.826	276.890	278.280	295.404	325.335	295.486	279.865	247.989	249.544	275.598
Take 12	275.953	276.043	275.209	292.263	294.304	247.853	290.510	293.243	277.681	278.258	293.921	326.914	294.806	278.958	248.107	250.386	277.055
Take 13	276.291	277.107	277.889	294.570	298.121	244.983	291.152	293.049	277.064	274.376	292.504	327.713	294.871	278.366	247.535	251.074	277.044
Take 14	273.802	276.052	276.758	290.755	290.174	245.398	288.089	285.831	272.351	274.485	291.582	328.194	291.032	276.167	245.342	247.129	273.429
Take 15	274.809	274.152	275.434	292.202	292.730	247.147	291.008	289.230	272.442	271.563	292.257	331.564	293.485	274.729	244.306	246.727	274.395
Take 16	274.473	276.791	274.398	291.178	292.566	242.669	292.287	291.230	272.981	273.622	292.673	326.791	288.782	276.192	246.100	244.519	275.521
Take 17	274.653	274.286	273.865	289.189	291.136	246.633	289.573	289.333	273.536	272.902	292.724	328.592	291.915	273.417	245.983	248.866	274.527
Take 18	276.052	277.930	277.118	292.290	292.261	244.790	290.952	290.974	273.265	274.113	293.256	328.032	291.306	276.074	246.346	246.325	276.094
Take 19	274.421	275.641	275.493	292.930	293.962	245.892	289.904	291.498	275.389	272.184	293.248	327.633	292.123	278.472	245.837	246.582	276.040
Take 20	274.074	272.829	273.391	291.269	287.009	243.886	287.814	292.796	273.963	272.671	293.169	329.780	294.946	274.614	246.049	245.341	276.414
Take 21	274.845	274.718	275.811	295.213	294.136	247.917	293.530	292.165	275.372	281.596	288.455	327.873	290.585	277.703	245.557	246.206	275.972
Ten 1 AVERAGE	**275.773**	**276.413**	**276.255**	**292.783**	**293.766**	**246.359**	**290.989**	**291.157**	**275.498**	**275.427**	**293.326**	**329.090**	**293.135**	**277.032**	**246.745**	**248.111**	**276.215**
Cents RF+3rds	-9.729	-5.720	-6.708	-6.109	-0.307	-4.997	-16.750	-15.750	-11.461	-11.903	-2.900	-3.732	-4.028	-1.844	-2.285	7.272	-6.956
Cents RF-3rds	-8.028	-4.019	-5.006	-4.407	1.394	-3.296	-15.049	-14.049	-9.759	-10.202	-1.199	-2.030	-2.327	-0.143	-0.584	8.974	-5.254
Just Int I	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-8.731	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686
Just Int II	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-29.219	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686
Pythagorean	7.820	7.820	7.820	-1.955	-1.955	3.910	-1.955	-1.955	7.820	7.820	-1.955	1.955	-1.955	7.820	3.910	3.910	7.820
Meantone	-13.686	-13.686	-13.686	3.422	3.422	-6.843	3.422	3.422	-13.686	-13.686	3.422	-3.421	3.422	-13.686	-6.843	-6.843	-13.686
Take 01	275.561	274.998	277.998	291.328	292.309	246.399	294.033	295.807	274.459	275.750	293.797	333.369	293.076	278.689	248.622	249.230	279.438
Take 02																	
Take 03	275.397	277.694	277.901	292.230	293.482	248.394	296.453	291.661	277.617	277.549	294.320	333.012	294.895	278.268	247.476	247.364	277.699
Take 04	275.863	277.421	275.815	294.961	292.589	245.433	291.553	292.069	275.994	273.718	292.413	330.567	293.066	277.668	248.918	249.127	277.083
Take 05																	
Take 06	275.472	275.259	275.610	294.260	288.743	247.530	291.266	291.075	276.613	274.351	291.954	330.624	292.404	276.139	246.607	246.623	276.247

Take 07	275.935	277.517	273.684	290.797	292.859	248.319	290.632	292.053	276.391	277.518	290.698	332.169	293.071	276.435	247.873	247.454	275.585
Take 08	275.741	276.850	277.684	292.680	295.432	246.505	289.734	294.604	277.592	278.439	290.776	330.061	292.181	278.640	247.060	246.691	276.303
Take 09	275.916	276.008	275.027	295.822	297.950	249.467	292.787	293.753	276.594	278.089	292.416	330.890	295.073	273.898	246.881	248.875	278.267
Take 10	277.153	277.725	278.633	295.197	294.566	248.827	294.774	293.807	275.916	278.150	292.966	332.192	293.457	279.433	247.322	248.446	276.849
Take 11	275.655	278.396	279.007	295.326	293.925	250.455	292.780	294.955	275.812	279.304	297.833	335.385	292.618	278.309	247.676	248.644	278.953
Take 12	276.152	276.742	279.216	294.280	295.271	249.571	295.515	295.189	279.919	278.055	291.231	333.198	297.170	278.490	247.955	247.896	276.982
Take 13	274.690	276.239	279.817	291.610	295.297	246.262	294.558	294.211	277.476	275.901	294.045	329.952	292.131	276.587	247.961	249.118	275.528
Take 14	274.598	275.460	278.373	291.342	292.408	247.297	287.834	290.070	274.788	275.799	293.397	329.128	292.592	272.899	245.526	249.096	275.646
Take 15	275.830	277.237	275.882	290.691	291.304	248.435	293.984	291.542	273.848	275.340	291.599	331.254	291.931	275.347	246.115	246.521	275.777
Take 16	275.011	273.259	273.937	291.632	292.936	247.038	289.778	289.207	276.452	278.516	290.767	329.630	294.117	277.682	246.856	247.912	274.231
Take 17	274.737	276.774	278.613	289.782	295.313	248.296	292.395	292.509	275.603	277.231	292.535	328.844	289.402	278.426	246.858	247.908	275.021
Take 18	274.774	274.496	274.453	293.190	292.917	246.925	289.068	287.592	274.633	278.024	296.371	328.290	288.220	277.780	244.715	246.644	274.381
Take 19	274.262	274.395	272.870	289.737	295.197	248.223	291.364	292.897	274.349	275.250	292.608	330.460	295.092	277.374	247.190	247.034	276.519
Take 20	276.096	275.026	275.873	293.725	296.618	249.731	291.028	290.143	275.458	276.179	289.583	332.344	304.738	277.824	246.347	249.804	273.904
Take 21	273.913	275.925	279.590	293.294	294.541	247.581	289.291	289.485	276.065	279.051	292.842	331.213	293.804	269.614	247.393	248.116	275.724
Ten 2 AVERAGE	275.408	276.180	276.841	292.731	293.877	247.931	292.043	292.244	276.083	276.959	292.745	331.189	293.634	276.816	247.124	248.027	276.323
Cents RF+3rds	-12.023	-7.177	-3.038	-6.420	0.344	6.018	-10.489	-9.303	-7.785	-2.303	-6.336	7.275	-1.088	-3.197	0.372	6.685	-6.282
Cents RF-3rds	-10.322	-5.476	-1.336	-4.718	2.045	7.719	-8.788	-7.601	-6.084	-0.602	-4.635	8.976	0.613	-1.495	2.073	8.386	-4.580
Just Int I	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-8.731	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686
Just Int II	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-29.219	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686
Pythagorean	7.820	7.820	7.820	-1.955	-1.955	3.910	-1.955	-1.955	7.820	7.820	-1.955	1.955	-1.955	7.820	3.910	3.910	7.820
Meantone	-13.686	-13.686	-13.686	3.422	3.422	-6.843	3.422	3.422	-13.686	-13.686	3.422	-3.421	3.422	-13.686	-6.843	-6.843	-13.686
Take 01	275.549	276.778	277.068	286.973	291.121	245.354	293.389	293.154	276.588	275.513	291.839	326.291	290.966	275.294	247.683	247.470	277.911
Take 02																	
Take 03	275.432	273.485	276.840	283.022	292.603	245.245	292.431	291.836	277.010	275.399	290.641	325.879	288.125	274.277	245.042	247.304	275.382
Take 04	273.991	271.414	272.939	287.561	293.659	243.562	287.850	291.903	270.439	271.508	291.620	324.265	289.346	275.139	245.969	245.713	276.463
Take 05																	
Take 06	275.163	273.542	273.855	289.806	293.023	246.039	283.906	290.174	273.111	275.756	290.800	325.445	289.921	272.819	244.654	247.267	275.464
Take 07	274.863	276.205	274.436	294.061	294.612	246.810	290.031	291.676	274.145	272.412	290.015	328.305	290.609	272.707	245.179	247.470	274.974
Take 08	274.926	273.476	274.921	289.403	291.903	244.238	283.911	288.210	273.626	271.592	291.237	328.243	292.939	273.126	245.297	247.059	272.005
Take 09	273.780	274.203	272.848	289.290	295.806	246.922	289.131	290.007	273.313	276.229	291.800	330.759	287.898	274.245	244.841	245.397	275.945
Take 10	274.285	275.949	276.867	288.170	289.435	246.518	287.131	289.872	273.386	274.687	295.738	327.739	290.733	274.271	246.885	245.165	275.896
Take 11	275.434	277.449	278.560	292.973	296.387	250.103	294.791	295.274	275.908	276.522	293.638	326.121	290.929	279.715	248.050	249.572	278.504
Take 12	272.609	275.175	273.942	289.090	291.397	250.280	289.789	291.586	275.412	278.156	292.121	324.806	294.573	276.930	247.123	246.571	276.372
Take 13	275.846	277.755	275.068	290.292	291.721	243.110	289.989	290.098	274.650	274.997	293.358	328.148	295.973	274.918	244.973	248.050	275.740
Take 14	273.744	272.121	273.054	288.790	291.492	245.364	285.377	285.680	272.788	274.977	289.184	327.182	290.051	275.601	244.689	248.624	274.486
Take 15	273.848	274.315	275.117	287.551	290.833	246.713	289.124	289.835	269.944	274.967	290.081	326.051	287.633	275.186	244.270	246.488	275.376
Take 16	273.016	273.081	273.604	287.754	292.849	245.161	291.501	289.768	274.490	274.304	292.273	326.879	293.769	275.952	245.286	247.429	274.458
Take 17	270.606	273.154	274.031	291.490	292.480	244.524	287.547	290.067	271.882	274.090	289.261	324.271	291.460	274.088	242.787	246.541	275.155
Take 18	273.670	273.267	272.871	287.724	286.634	244.759	285.272	288.345	271.765	273.701	293.602	329.380	289.828	276.501	244.150	244.313	275.916
Take 19	273.815	274.339	272.511	288.462	291.646	246.209	289.742	291.039	273.883	273.740	294.265	328.177	290.002	273.110	244.210	247.337	274.827
Take 20	272.802	272.651	274.147	288.313	290.014	249.617	289.979	288.928	267.944	275.898	290.242	324.933	290.345	276.232	244.763	246.463	274.137
Take 21	273.008	273.138	272.598	286.706	288.550	245.461	291.041	287.393	275.395	278.490	297.530	323.583	288.638	274.249	244.670	245.856	274.578
Ten 3 AVERAGE	274.020	274.289	274.488	288.812	291.903	246.105	289.049	290.255	273.457	274.892	292.066	326.656	290.723	274.966	245.291	246.847	275.452
Cents RF+3rds	-20.769	-19.070	-17.815	-29.750	-11.319	-6.782	-28.332	-21.123	-24.333	-15.274	-10.358	-16.584	-18.334	-14.803	-12.519	-1.570	-11.747
Cents RF-3rds	-19.067	-17.369	-16.114	-28.049	-9.618	-5.080	-26.630	-19.422	-22.632	-13.572	-8.657	-14.883	-16.632	-13.101	-10.818	0.131	-10.045
Just Int I	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-8.731	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686
Just Int II	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-29.219	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686
Pythagorean	7.820	7.820	7.820	-1.955	-1.955	3.910	-1.955	-1.955	7.820	7.820	-1.955	1.955	-1.955	7.820	3.910	3.910	7.820
Meantone	-13.686	-13.686	-13.686	3.422	3.422	-6.843	3.422	3.422	-13.686	-13.686	3.422	-3.421	3.422	-13.686	-6.843	-6.843	-13.686
Take 01	275.253	277.044	276.712	293.202	294.065	247.799	294.416	293.078	275.155	280.375	295.846	335.989	293.253	275.357	247.252	247.597	280.425
Take 02																	
Take 03	280.356	275.918	274.382	291.242	294.175	248.836	295.448	295.273	277.396	279.132	294.363	335.280	290.709	277.155	247.410	249.584	279.217
Take 04	273.939	276.186	276.076	290.799	292.969	248.544	291.505	303.988	273.745	279.920	290.124	341.303	288.763	275.189	247.628	251.769	281.054

Take 05																						
Take 06	274.617	274.624	275.898	292.618	292.236	246.712	290.270	291.216	273.194	280.040	292.594	334.091	290.414	275.112	247.158	247.959	278.598					
Take 07	275.101	276.398	277.052	295.107	296.245	249.833	287.620	289.421	275.041	276.703	288.178	281.204	287.381	271.137	246.851	250.594	278.416					
Take 08	278.309	274.233	276.555	297.491	293.699	249.751	287.996	295.654	274.666	278.649	289.683	335.442	286.462	271.727	246.672	249.952	275.703					
Take 09	279.440	277.217	277.111	292.759	295.921	250.041	292.026	293.441	277.824	280.403	290.009	334.435	296.912	282.287	244.816	250.208	278.059					
Take 10	278.207	279.948	279.718	294.950	293.884	247.876	294.751	293.112	275.311	279.077	298.046	329.959	298.477	277.157	247.018	249.269	279.101					
Take 11	278.085	284.164	280.965	294.914	294.959	250.559	292.195	293.138	280.292	279.075	292.864	335.913	298.833	278.912	248.140	250.504	278.642					
Take 12	278.605	278.845	275.695	293.016	296.021	249.268	293.717	296.494	276.796	278.981	289.032	310.374	293.358	279.128	247.096	248.538	278.409					
Take 13	278.419	280.013	277.147	294.000	292.752	248.197	296.836	291.740	277.643	279.359	294.739	320.785	294.617	276.022	248.503	250.374	279.442					
Take 14	276.658	277.699	275.950	290.779	292.414	246.503	287.575	289.442	272.880	275.517	288.996	327.497	292.416	276.507	245.405	249.513	276.417					
Take 15	272.905	276.338	274.909	289.912	293.984	247.786	290.993	290.505	272.696	277.328	288.143	329.727	293.428	278.577	246.698	249.700	277.133					
Take 16	274.508	275.490	279.716	289.502	291.612	248.070	289.744	291.024	275.424	278.557	292.224	320.602	294.689	275.967	246.321	249.996	276.357					
Take 17	271.940	272.819	276.221	294.798	294.555	247.912	289.906	289.780	273.216	277.462	290.447	334.044	291.205	276.395	246.451	247.390	276.289					
Take 18	278.694	276.703	276.621	293.817	295.612	245.490	289.769	293.014	277.957	278.398	295.435	169.391	295.832	278.409	246.678	248.250	278.250					
Take 19	275.932	274.871	276.422	288.343	292.684	248.082	289.164	289.478	273.133	276.677	289.367	311.128	291.182	276.609	246.607	250.671	277.315					
Take 20	274.937	275.289	280.696	295.039	292.250	248.290	292.812	301.065	297.973	286.876	297.378	334.041	295.353	274.070	246.085	248.335	276.389					
Take 21	275.003	277.539	279.487	296.542	296.803	249.434	298.277	297.474	282.901	282.922	296.089	338.678	296.733	277.708	246.206	248.328	278.296					
Ten 4 AVERAGE	**276.364**	**276.510**	**277.228**	**293.096**	**294.044**	**248.367**	**291.843**	**293.182**	**275.848**	**278.810**	**292.292**	**332.746**	**293.159**	**276.496**	**246.789**	**249.396**	**278.080**					
Cents RF+3rds	-6.027	-5.113	-0.621	-4.259	1.331	9.062	-11.676	-3.754	-9.258	9.229	-9.015	15.397	-3.890	-5.198	-1.973	16.220	4.689					
Cents RF-3rds	-4.326	-3.412	1.081	-2.558	3.032	10.764	-9.975	-2.052	-7.557	10.930	-7.313	17.098	-2.188	-3.497	-0.272	17.921	6.390					
Just Int I	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-8.731	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686					
Just Int II	-13.686	-13.686	-13.686	-29.219	-29.219	3.910	-29.219	-29.219	-13.686	-13.686	-29.219	1.995	-1.955	-13.686	3.910	3.910	-13.686					
Pythagorean	7.820	7.820	7.820	-1.955	-1.955	3.910	-1.955	-1.955	7.820	7.820	-1.955	1.955	-1.955	7.820	3.910	3.910	7.820					
Meantone	-13.686	-13.686	-13.686	3.422	3.422	-6.843	3.422	3.422	-13.686	-13.686	3.422	-3.421	3.422	-13.686	-6.843	-6.843	-13.686					

Third Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22
Take 01	282.309	279.935	278.372	279.014	266.861	263.480	235.137	221.711	199.354	197.984	221.261	223.509	249.146	247.368	279.813	295.761	328.013	277.108	277.768	290.114	243.126	165.949
Take 02																						
Take 03	281.369	279.426	278.530	277.797	264.369	261.598	232.895	220.090	195.159	195.652	220.580	220.777	250.294	250.580	278.110	294.383	335.584	280.431	279.153	296.552	247.703	164.594
Take 04	282.878	280.460	281.675	278.837	264.648	263.967	233.221	221.296	197.159	194.898	220.064	221.355	249.806	251.415	282.889	298.901	333.918	279.499	279.571	292.995	246.262	165.008
Take 05																						
Take 06	277.783	266.183	277.853	276.775	263.608	262.330	232.923	220.258	196.875	194.028	219.914	220.036	248.908	248.645	278.453	298.085	334.325	276.267	276.944	290.490	246.926	164.892
Take 07	278.214	276.958	276.559	276.527	262.129	262.765	233.699	221.988	197.967	196.685	220.857	219.647	248.215	249.083	276.474	295.048	326.591	275.940	275.359	289.393	243.837	163.468
Take 08	279.525	277.307	277.678	274.030	260.568	258.091	229.625	217.267	194.062	194.019	218.393	217.241	246.610	247.920	278.331	295.009	333.693	276.458	275.415	291.807	247.315	163.170
Take 09	280.911	279.079	278.303	277.610	260.997	261.281	231.294	217.749	194.838	197.656	218.969	219.904	248.149	247.322	276.656	289.829	325.520	271.917	275.480	298.391	245.994	164.136
Take 10	280.689	279.061	279.303	278.557	264.305	261.815	234.313	221.273	196.841	197.891	220.925	223.171	249.734	247.585	281.566	293.981	333.036	280.583	279.568	294.069	247.336	165.814
Take 11	0.000	0.000	214.599	281.421	265.221	258.656	234.456	221.425	197.235	197.958	221.037	223.243	249.544	247.918	277.941	295.595	330.475	276.799	277.982	294.983	247.299	165.666
Take 12	281.089	278.665	276.307	277.658	263.425	259.212	232.749	218.404	195.432	195.934	219.996	220.942	247.653	245.947	278.124	297.161	329.814	276.844	274.598	291.221	247.345	164.741
Take 13	280.197	280.396	277.976	279.306	265.304	260.296	232.209	221.857	197.586	196.639	220.219	221.437	248.961	251.152	278.699	294.685	332.314	279.688	279.936	295.958	248.579	164.212
Take 14	277.567	273.558	273.559	276.221	261.627	259.004	232.184	217.526	195.278	194.957	218.175	218.227	244.942	245.093	277.324	291.737	328.514	272.260	273.452	292.309	244.478	163.741
Take 15	276.862	276.052	276.399	277.526	262.555	259.819	231.423	218.747	195.042	195.408	219.794	219.770	246.420	246.951	277.734	293.107	330.257	276.017	276.392	290.145	242.601	162.946
Take 16	277.394	276.432	275.689	274.047	257.345	259.247	230.050	219.587	196.086	194.065	219.207	220.269	247.947	248.349	276.437	287.409	331.032	277.862	274.855	287.066	244.201	161.759
Take 17	277.825	275.020	276.914	277.359	261.985	258.379	229.443	216.473	192.919	193.464	219.622	220.002	247.097	245.164	273.310	292.739	330.460	276.569	276.752	291.430	248.269	163.494
Take 18	279.486	280.052	275.666	277.751	262.173	259.669	234.207	219.562	194.011	191.979	219.145	220.792	247.430	245.394	278.969	287.537	331.207	275.228	274.175	289.431	241.811	162.952
Take 19	279.703	280.196	276.868	278.937	262.561	261.536	231.871	219.183	195.744	195.485	219.028	218.077	244.744	243.906	276.471	293.260	330.474	273.828	276.228	290.132	244.803	162.816
Take 20	278.356	279.140	278.832	278.763	265.235	261.382	232.218	218.432	195.937	196.167	223.049	220.304	248.570	245.544	276.684	292.708	327.924	276.078	275.304	292.238	246.153	162.889
Take 21	280.710	277.924	279.270	278.086	264.972	263.670	233.603	220.357	196.019	194.889	220.846	222.162	247.459	247.434	274.531	288.083	330.238	275.694	274.492	290.067	243.900	164.425
Ten 1 AVERAGE	**279.604**	**277.547**	**277.542**	**277.696**	**263.152**	**260.853**	**232.501**	**219.641**	**195.976**	**195.566**	**220.057**	**220.572**	**247.981**	**247.514**	**277.817**	**293.422**	**330.705**	**276.583**	**276.496**	**292.042**	**245.681**	**164.035**
Cents RF+3rds	8.330	-4.452	-4.483	-3.523	3.345	-11.849	-11.045	-9.551	-6.916	-10.542	-6.278	-2.231	0.543	-2.717	-2.770	-8.157	-1.078	-10.477	-11.020	-16.321	-15.587	-14.922
Cents RF-3rds	12.597	-0.185	-0.216	0.744	7.613	-7.582	-6.778	-5.284	-2.649	-6.275	-2.011	2.036	4.810	1.551	1.497	-3.890	3.189	-6.210	-6.753	-12.054	-11.320	-10.655
Just Int I	-13.686	-13.686	-13.686	-13.686	7.820	7.820	-37.039	-21.506	-3.910	-3.910	-21.506	-21.506	-39.102	-39.102	-35.192	-19.551	-19.551	-35.192	-35.192	-23.461	-17.596	-19.551
Just Int II	-13.686	-13.686	-13.686	-13.686	29.326	29.326	-15.532	0.000	17.596	17.596	0.000	0.000	-17.596	-17.596	-13.686	-1.955	1.955	-13.686	-13.686	-1.955	3.910	1.955
Pythagorean	7.820	7.820	7.820	7.820	-5.865	-5.865	4.955	0.000	-3.910	-3.910	0.000	0.000	3.910	3.910	7.820	-1.955	1.955	7.820	7.820	-1.955	3.910	1.955
Meantone	-13.686	-13.686	-13.686	-13.686	10.265	10.265	17.107	0.000	6.843	6.843	0.000	0.000	-6.843	-6.843	-13.686	3.422	-3.421	-13.686	-13.686	3.422	-6.843	-3.421

11.6 - THE BBC SINGERS TENORS' RESULTS

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Take 01	280.586	279.673	279.088	282.819	265.210	263.666	233.346	222.994	199.459	198.147	220.838	221.824	248.704	249.940	276.667	291.646	317.371	271.310	278.336	292.811	247.850	165.859
Take 02																						
Take 03	278.904	278.147	277.270	279.645	262.935	260.886	233.070	220.295	196.228	195.834	217.184	219.523	248.237	244.018	279.336	292.657	323.210	273.960	276.479	292.409	247.789	164.149
Take 04	277.167	279.873	277.264	281.416	262.500	258.651	230.340	218.480	192.892	193.710	215.714	221.182	247.001	247.741	279.409	295.624	325.346	272.559	280.092	293.776	248.532	163.761
Take 05																						
Take 06	278.601	276.114	276.745	278.614	260.090	258.850	229.324	218.842	194.012	193.982	220.243	220.135	249.964	247.875	278.363	291.867	333.738	274.469	277.205	291.965	246.014	165.483
Take 07	278.853	276.586	275.604	275.463	261.343	259.067	229.966	219.962	197.015	196.095	218.819	220.254	250.486	249.110	275.767	294.983	331.904	276.219	275.826	292.447	248.669	164.330
Take 08	277.942	280.174	275.131	278.027	262.321	259.472	227.072	217.057	194.478	193.360	217.414	222.011	249.836	245.396	279.951	293.261	329.104	276.316	276.114	295.066	246.934	163.883
Take 09	281.260	280.511	276.153	279.162	263.177	258.682	228.925	217.647	195.366	195.529	216.551	219.523	247.007	247.435	277.967	292.862	335.988	280.720	276.532	292.026	246.972	161.148
Take 10	280.060	281.017	280.237	279.225	265.478	262.727	234.172	222.181	197.112	196.769	219.263	220.784	250.448	245.969	276.350	293.808	331.558	279.313	281.326	293.726	247.354	165.965
Take 11	280.829	279.988	277.623	277.895	262.551	261.564	230.411	221.595	195.479	198.701	219.875	222.493	247.421	248.021	279.704	294.311	330.223	271.343	276.544	294.316	247.432	165.244
Take 12	279.988	277.390	277.495	278.614	262.703	258.870	232.004	218.371	192.134	195.485	219.392	218.290	248.030	244.780	277.652	293.474	328.959	272.281	276.077	289.497	246.731	164.807
Take 13	278.995	278.103	275.349	278.284	262.759	260.211	229.806	220.738	193.604	195.210	219.231	222.003	247.150	244.792	276.418	293.951	327.605	278.367	279.228	293.455	247.634	164.191
Take 14	276.351	276.721	275.466	273.421	258.013	260.204	228.029	216.991	196.092	194.668	216.427	219.000	245.876	243.924	275.496	292.617	329.691	275.153	274.385	293.249	247.095	164.365
Take 15	275.659	278.569	275.353	274.062	257.895	256.083	229.789	218.826	195.042	194.867	217.009	221.278	246.241	246.817	278.422	295.363	320.426	276.839	276.617	294.887	247.547	163.416
Take 16	277.305	280.381	274.389	278.386	266.145	261.950	225.352	215.033	191.003	193.187	217.251	217.197	246.198	246.058	276.260	295.181	327.350	271.829	273.955	295.026	250.337	162.033
Take 17	278.961	277.248	274.998	275.848	263.368	257.834	226.464	216.946	193.742	194.447	216.188	217.778	246.587	242.935	277.832	291.378	328.654	276.244	275.836	290.248	247.468	165.053
Take 18	277.941	274.133	274.973	271.229	257.502	261.220	230.561	216.405	192.733	197.630	217.916	218.040	247.351	244.613	277.504	292.171	317.048	274.919	274.224	290.038	247.326	164.603
Take 19	277.183	277.438	274.708	278.164	261.517	256.323	226.989	218.122	192.677	193.950	217.051	218.859	245.329	244.671	274.898	292.686	325.888	275.052	274.773	288.937	244.819	162.095
Take 20	280.288	280.570	274.701	278.148	264.573	264.652	231.937	219.335	193.046	192.922	216.389	220.462	248.710	248.068	282.016	296.986	335.461	281.253	275.009	293.738	256.332	161.620
Take 21	278.030	278.633	274.953	277.358	261.767	259.012	231.109	218.878	196.166	193.981	219.734	221.392	248.402	245.954	279.099	294.581	328.451	276.535	275.166	292.704	247.576	164.224
Ten 2 AVERAGE	**278.679**	**278.488**	**276.184**	**277.673**	**262.202**	**259.996**	**229.930**	**218.879**	**194.646**	**195.183**	**218.026**	**220.107**	**247.841**	**246.217**	**277.848**	**293.653**	**328.385**	**275.510**	**276.512**	**292.648**	**247.916**	**164.012**
Cents RF+3rds	2.596	1.407	-12.973	-3.668	-2.913	-17.543	-30.299	-15.570	-18.704	-13.939	-22.332	-5.887	-0.432	-11.816	-2.575	-6.796	-13.265	-17.207	-10.920	-12.728	0.094	-15.168
Cents RF-3rds	6.863	5.675	-8.706	0.599	1.354	-13.275	-26.031	-11.303	-14.437	-9.672	-18.065	-1.619	3.835	-7.549	1.692	-2.529	-8.998	-12.940	-6.653	-8.460	4.361	-10.901
Just Int I	-13.686	-13.686	-13.686	-13.686	7.820	7.820	-37.039	-21.506	-3.910	-3.910	-21.506	-21.506	-39.102	-39.102	-35.192	-19.551	-19.551	-35.192	-35.192	-23.461	-17.596	-19.551
Just Int II	-13.686	-13.686	-13.686	-13.686	29.326	29.326	-15.532	0.000	17.596	17.596	0.000	0.000	-17.596	-17.596	-13.686	-1.955	1.955	-13.686	-13.686	-1.955	3.910	1.955
Pythagorean	7.820	7.820	7.820	7.820	-5.865	-5.865	4.955	0.000	-3.910	-3.910	0.000	0.000	3.910	3.910	7.820	-1.955	1.955	7.820	7.820	-1.955	3.910	1.955
Meantone	-13.686	-13.686	-13.686	-13.686	10.265	10.265	17.107	0.000	6.843	6.843	0.000	0.000	-6.843	-6.843	-13.686	3.422	-3.421	-13.686	-13.686	3.422	-6.843	-3.421
Take 01	279.511	277.000	276.639	277.783	261.910	259.606	228.951	214.018	193.421	195.367	218.717	220.154	248.514	246.311	279.090	294.184	332.283	280.027	278.307	291.582	249.046	164.521
Take 02																						
Take 03	277.379	274.809	275.140	273.019	259.620	257.819	226.893	217.251	189.997	194.976	218.329	219.594	248.981	249.325	279.732	293.298	328.985	275.504	275.947	292.025	245.676	163.698
Take 04	277.103	278.724	273.903	277.258	260.907	259.021	229.127	217.173	191.289	192.506	216.196	219.186	247.710	246.052	279.010	290.327	330.661	274.266	276.491	289.327	246.726	161.403
Take 05																						
Take 06	278.187	276.466	275.797	274.551	263.681	260.270	231.782	219.827	194.418	194.788	217.125	220.423	248.197	246.277	281.937	292.399	335.169	276.930	272.782	287.981	245.751	163.159
Take 07	276.614	275.818	273.216	276.577	262.206	259.249	230.807	216.068	192.817	194.292	218.177	221.317	248.174	246.690	276.254	289.413	320.930	273.301	273.874	288.512	246.032	162.206
Take 08	275.606	273.048	271.531	273.773	260.869	256.955	227.958	218.387	0.000	191.323	215.826	214.229	247.427	247.108	277.862	291.071	335.893	270.083	274.536	286.516	243.494	160.666
Take 09	279.483	275.732	275.595	274.889	258.047	259.698	228.859	214.930	193.467	192.498	215.251	218.229	248.148	240.681	275.871	295.218	328.325	315.481	272.887	290.747	245.012	164.590
Take 10	278.588	276.418	275.974	278.724	263.033	258.460	230.929	217.408	192.243	192.682	218.435	218.673	248.097	244.422	281.549	293.062	327.210	278.571	279.061	290.279	247.242	165.566
Take 11	278.917	276.460	275.925	281.102	262.549	259.441	229.041	219.023	192.477	193.264	220.190	221.717	248.671	242.815	277.760	292.819	325.764	277.742	274.926	289.478	246.702	165.434
Take 12	281.089	278.113	276.307	277.658	263.425	259.212	232.749	218.404	195.432	195.934	219.996	220.942	247.653	245.947	278.124	297.161	328.506	276.844	274.598	291.221	247.345	164.741
Take 13	276.345	271.786	273.573	274.114	259.427	257.534	230.087	213.638	191.129	192.350	217.999	219.514	250.630	244.354	278.053	290.991	329.879	276.623	277.374	288.759	247.682	160.951
Take 14	275.764	273.491	273.402	276.155	261.555	256.098	228.861	216.403	192.618	193.923	217.856	215.934	247.591	244.856	277.079	290.666	329.328	277.240	276.020	285.859	244.162	163.044
Take 15	275.604	272.170	272.960	274.539	261.369	254.321	229.885	216.898	192.531	193.328	217.550	218.542	245.850	245.413	277.524	290.481	329.589	273.010	276.728	287.574	243.848	163.302
Take 16	277.250	275.390	274.202	275.866	258.227	255.718	229.163	214.618	192.687	193.358	214.984	217.651	245.821	242.494	276.355	288.145	328.601	272.207	273.339	288.312	246.269	161.451
Take 17	278.152	276.628	273.834	277.724	258.533	255.231	225.528	212.594	191.829	190.723	212.216	216.524	249.335	244.657	277.332	287.680	329.916	275.836	272.353	289.789	246.628	162.812
Take 18	277.470	275.723	273.235	275.764	257.923	259.177	228.889	213.299	191.776	191.645	215.586	217.902	245.853	244.673	277.774	288.164	328.248	271.234	273.401	287.098	247.593	162.457
Take 19	278.060	275.514	273.531	274.468	261.941	259.191	227.542	214.840	191.389	190.749	214.489	217.220	248.485	241.206	275.276	292.387	330.897	278.314	275.332	289.718	245.289	162.432
Take 20	274.839	276.088	268.695	277.426	258.953	257.959	228.084	214.619	193.865	193.109	214.995	220.423	247.753	249.508	279.676	292.863	325.836	273.310	276.509	291.160	246.767	162.130
Take 21	277.027	272.707	270.580	274.518	255.042	255.382	229.152	215.998	192.467	193.340	214.299	218.448	247.216	244.509	273.963	292.822	326.293	274.446	273.821	289.554	246.722	158.507
Ten 3 AVERAGE	**277.526**	**275.373**	**273.897**	**276.100**	**260.485**	**257.913**	**229.173**	**216.073**	**192.547**	**193.166**	**216.748**	**218.770**	**247.900**	**245.121**	**277.906**	**291.745**	**329.069**	**277.420**	**275.173**	**289.236**	**246.210**	**162.793**
Cents RF+3rds	-4.586	-18.066	-27.371	-13.499	-14.289	-31.470	-36.005	-37.904	-37.474	-31.921	-32.506	-16.436	-0.018	-19.538	-2.212	-18.082	-9.662	-5.247	-19.324	-33.032	-11.865	-28.082
Cents RF-3rds	-0.318	-13.799	-23.104	-9.232	-10.022	-27.203	-31.738	-33.637	-33.207	-27.654	-28.239	-12.168	4.249	-15.271	2.056	-13.815	-5.395	-0.980	-15.057	-28.764	-7.597	-23.815
Just Int I	-13.686	-13.686	-13.686	-13.686	7.820	7.820	-37.039	-21.506	-3.910	-3.910	-21.506	-21.506	-39.102	-39.102	-35.192	-19.551	-19.551	-35.192	-35.192	-23.461	-17.596	-19.551
Just Int II	-13.686	-13.686	-13.686	-13.686	29.326	29.326	-15.532	0.000	17.596	17.596	0.000	0.000	-17.596	-17.596	-13.686	-1.955	1.955	-13.686	-13.686	-1.955	3.910	1.955

Pythagorean	7.820	7.820	7.820	7.820	-5.865	-5.865	4.955	0.000	-3.910	-3.910	0.000	0.000	3.910	3.910	7.820	-1.955	1.955	7.820	7.820	-1.955	3.910	1.955
Meantone	-13.686	-13.686	-13.686	-13.686	10.265	10.265	17.107	0.000	6.843	6.843	0.000	0.000	-6.843	-6.843	-13.686	3.422	-3.421	-13.686	-13.686	3.422	-6.843	-3.421
Take 01	279.265	278.934	278.045	281.041	266.578	261.527	233.868	218.073	194.671	193.084	217.045	223.755	247.745	245.215	277.130	289.792	305.002	272.350	274.519	288.300	246.559	165.955
Take 02																						
Take 03	279.687	278.544	275.878	280.821	265.089	262.841	231.732	218.556	195.443	194.997	218.724	218.219	249.190	249.022	277.288	289.821	325.161	272.877	274.075	286.551	246.173	165.321
Take 04	282.028	279.383	277.541	280.408	262.176	260.247	231.651	217.836	194.265	191.813	217.756	219.879	249.123	250.429	277.271	292.745	296.750	275.935	276.559	293.609	251.453	165.309
Take 05																						
Take 06	277.124	275.251	274.411	278.787	261.880	261.111	230.478	217.422	192.566	192.954	216.848	220.606	249.669	245.857	279.154	291.141	279.233	274.000	273.854	291.218	246.611	163.717
Take 07	277.782	278.344	275.545	281.474	268.366	264.132	232.214	217.754	194.054	193.795	218.943	220.386	250.457	245.417	275.463	292.614	331.235	275.212	273.661	286.303	248.637	164.557
Take 08	277.916	272.054	271.622	276.118	263.782	261.030	230.215	214.464	192.428	190.995	216.227	218.688	249.740	246.146	278.542	291.356	329.731	277.440	278.061	292.544	246.661	165.001
Take 09	282.828	280.355	278.193	280.544	261.814	261.584	230.933	216.144	191.201	192.977	216.868	221.249	249.900	248.493	279.602	295.326	331.354	313.465	272.562	291.361	248.332	165.126
Take 10	281.188	278.402	278.449	277.425	259.955	262.714	230.080	218.525	197.961	193.106	221.737	220.423	247.864	248.101	274.993	290.050	330.429	277.092	277.585	288.716	245.853	164.563
Take 11	280.233	280.236	276.993	279.366	263.650	262.629	233.233	221.491	195.266	196.630	219.707	224.694	246.065	245.986	277.578	292.334	325.862	275.412	275.070	287.314	248.045	164.956
Take 12	279.988	277.224	277.495	278.614	262.703	258.870	232.004	218.371	192.134	195.485	219.392	218.290	248.030	244.654	277.427	293.245	328.959	272.281	275.733	289.497	246.731	164.807
Take 13	279.526	279.290	274.749	279.125	262.605	263.822	235.156	219.182	195.023	189.512	215.819	221.019	249.945	246.085	276.316	292.175	315.238	274.032	274.981	289.750	248.885	164.724
Take 14	276.995	276.810	275.929	275.096	260.755	259.107	227.880	216.485	190.053	193.887	216.723	217.506	247.845	243.568	274.041	292.909	331.554	276.897	276.690	287.336	244.206	162.751
Take 15	278.708	275.906	274.167	275.016	261.064	258.668	227.750	217.241	190.918	192.971	218.075	218.950	247.588	247.172	274.911	291.938	326.974	275.679	274.928	290.517	244.877	163.564
Take 16	279.634	274.430	272.437	275.749	262.117	260.974	230.275	215.662	194.693	191.573	215.458	216.570	247.883	248.390	277.359	291.346	333.299	279.704	275.885	292.316	248.677	163.660
Take 17	282.375	276.384	273.252	277.176	260.779	261.344	228.797	215.657	189.503	190.731	215.339	218.337	247.925	245.631	277.213	293.600	334.651	270.699	273.785	291.787	243.729	163.898
Take 18	281.022	277.927	277.268	280.271	263.641	260.151	226.984	215.790	189.979	193.594	217.403	220.062	245.073	249.348	279.342	293.816	331.813	277.566	276.218	291.063	244.234	163.037
Take 19	280.675	275.168	276.481	277.695	262.772	261.887	227.278	215.392	193.130	191.719	214.900	220.026	245.911	248.608	275.698	290.538	323.721	278.837	276.912	289.049	250.619	162.408
Take 20	279.266	277.189	275.490	277.558	265.387	261.086	229.700	217.802	196.886	195.477	217.144	218.372	248.885	248.771	276.489	288.375	333.723	273.116	275.653	293.713	247.925	163.391
Take 21	279.213	277.866	276.870	277.821	264.451	261.633	230.023	217.672	190.554	190.991	217.328	218.707	252.242	247.439	274.405	296.097	181.159	281.692	273.565	0.000	237.938	162.480
Ten 4 AVERAGE	279.761	277.352	275.832	278.427	263.135	261.335	230.540	217.343	193.196	192.963	217.444	219.776	248.478	247.070	276.854	292.064	328.914	277.594	275.279	290.052	246.639	164.170
Cents RF+3rds	9.302	-5.666	-15.179	1.026	3.234	-8.652	-25.713	-27.760	-31.650	-33.745	-26.957	-8.492	4.011	-5.825	-8.781	-16.188	-10.480	-4.158	-18.658	-28.154	-8.848	-13.505
Cents RF-3rds	13.569	-1.398	-10.912	5.293	7.501	-4.385	-21.446	-23.493	-27.382	-29.478	-22.690	-4.225	8.278	-1.558	-4.514	-11.921	-6.213	0.109	-14.391	-23.887	-4.581	-9.238
Just Int I	-13.686	-13.686	-13.686	-13.686	7.820	7.820	-37.039	-21.506	-3.910	-3.910	-21.506	-21.506	-39.102	-39.102	-35.192	-19.551	-19.551	-35.192	-35.192	-23.461	-17.596	-19.551
Just Int II	-13.686	-13.686	-13.686	-13.686	29.326	29.326	-15.532	0.000	17.596	17.596	0.000	0.000	-17.596	-17.596	-13.686	-1.955	1.955	-13.686	-13.686	-1.955	3.910	1.955
Pythagorean	7.820	7.820	7.820	7.820	-5.865	-5.865	4.955	0.000	-3.910	-3.910	0.000	0.000	3.910	3.910	7.820	-1.955	1.955	7.820	7.820	-1.955	3.910	1.955
Meantone	-13.686	-13.686	-13.686	-13.686	10.265	10.265	17.107	0.000	6.843	6.843	0.000	0.000	-6.843	-6.843	-13.686	3.422	-3.421	-13.686	-13.686	3.422	-6.843	-3.421

Fourth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18
Take 01	247.556	247.537	249.579	223.314	202.901	279.710	279.882	280.216	278.907	246.776	219.403	300.724	296.508	300.206	296.821	222.190	223.666	199.931
Take 02																		
Take 03	249.114	247.584	250.083	221.142	198.957	279.332	277.442	282.090	280.651	246.933	221.120	298.013	292.760	300.997	298.184	221.884	220.353	198.354
Take 04	249.146	249.350	251.333	221.163	198.121	283.286	278.489	281.519	277.491	246.510	218.560	294.936	292.375	297.681	294.752	222.198	220.695	197.428
Take 05																		
Take 06	246.337	246.050	245.258	218.405	195.072	273.970	273.683	275.546	274.593	245.455	222.820	292.941	290.289	301.091	288.187	219.326	219.956	197.217
Take 07	247.278	249.515	247.429	220.087	195.537	277.457	276.721	278.949	275.846	245.548	224.519	300.155	293.628	303.020	293.770	220.042	219.779	194.921
Take 08	247.330	246.704	247.786	218.492	198.109	281.985	276.240	276.985	276.660	245.682	219.746	302.249	293.578	298.443	295.068	219.003	218.559	195.885
Take 09	247.908	246.857	248.510	218.923	195.335	277.063	274.306	276.383	274.948	245.488	224.405	294.839	293.555	299.699	294.079	219.921	219.203	195.992
Take 10	249.590	248.779	249.073	223.228	198.818	280.262	279.347	278.342	278.515	248.451	223.480	291.141	290.032	295.072	293.308	221.500	219.861	198.429
Take 11	248.502	248.972	249.225	223.387	202.786	279.560	276.998	279.722	278.251	247.812	226.285	297.947	292.479	297.662	299.462	221.095	220.604	197.423
Take 12	249.009	247.250	249.125	219.649	200.151	278.355	276.803	278.942	281.093	248.349	224.816	296.235	292.901	293.196	296.006	220.234	219.345	197.357
Take 13	250.589	249.754	250.849	222.772	196.377	279.537	275.542	276.091	275.580	247.322	222.548	295.422	290.756	288.070	291.992	221.735	218.933	196.143
Take 14	246.480	246.299	246.788	221.784	197.740	277.930	274.974	274.498	273.507	245.260	219.446	287.174	291.827	296.360	294.054	219.009	220.103	194.640
Take 15	247.388	248.061	247.094	218.750	196.195	278.488	276.700	277.840	276.141	246.633	222.615	296.970	294.196	296.436	293.390	220.200	221.150	195.589
Take 16	245.101	245.753	247.504	219.873	192.787	275.890	274.120	275.693	277.019	246.325	222.138	289.814	292.062	294.273	294.849	220.670	218.522	197.415
Take 17	247.281	247.353	247.130	218.766	194.569	276.428	273.631	276.975	273.365	243.393	221.098	294.567	290.008	292.558	294.191	219.166	218.878	195.488
Take 18	247.599	247.573	246.160	219.104	196.451	281.658	276.893	279.967	273.850	247.039	222.636	295.808	290.724	291.670	291.675	220.058	221.034	196.363
Take 19	245.630	244.835	246.435	219.685	198.867	273.845	272.963	274.655	276.309	242.420	224.618	294.105	293.581	290.973	295.873	218.824	216.861	193.629
Take 20	246.506	243.031	246.141	221.805	198.244	276.841	274.530	275.591	278.734	245.738	222.645	288.941	296.692	289.358	298.509	221.877	220.399	197.647
Take 21	247.366	246.911	246.038	219.162	198.729	277.099	274.334	277.559	275.159	245.889	219.383	290.390	289.759	289.484	294.537	221.385	217.466	194.804
Ten 1 AVERAGE	247.669	247.272	247.976	220.500	197.671	278.352	275.979	277.767	276.664	246.159	222.225	294.862	292.511	295.592	294.669	220.543	219.756	196.561

Cents RF+3rds	4.595	1.817	6.739	3.430	14.219	6.793	-8.033	3.146	-3.737	-5.991	16.926	6.545	-7.312	10.827	5.413	3.771	-2.417	4.469
Cents RF-3rds	8.504	5.726	10.647	7.339	18.128	10.702	-4.124	7.055	0.171	-2.083	20.835	10.453	-3.403	14.736	9.321	7.680	1.492	8.378
Just Int I	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Just Int II	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Pythagorean	5.865	5.865	5.865	1.955	-1.955	9.775	9.775	9.775	9.775	5.865	1.955	0.000	0.000	0.000	0.000	1.955	1.955	-1.955
Meantone	-10.264	-10.264	-10.264	-3.421	-29.219	-17.108	-17.108	-17.108	-17.108	-10.264	-3.421	0.000	0.000	0.000	0.000	-3.421	-3.421	3.422
Take 01	246.552	248.481	246.923	220.230	197.993	277.217	276.916	278.617	274.339	249.712	224.820	293.831	296.035	299.289	298.578	220.941	220.500	196.571
Take 02																		
Take 03	249.030	248.571	246.678	218.809	193.670	279.866	274.821	276.997	274.921	246.845	225.400	294.535	293.301	297.399	294.741	219.434	220.087	196.495
Take 04	245.624	250.462	248.969	218.568	195.549	279.013	276.452	278.328	278.947	247.278	221.798	295.527	294.256	298.052	296.317	219.891	218.359	197.507
Take 05																		
Take 06	244.664	244.846	246.172	218.663	194.578	278.649	274.245	278.298	276.152	243.461	217.599	292.089	293.927	293.781	293.617	219.325	220.561	193.963
Take 07	246.718	244.556	247.048	220.046	196.715	275.048	275.770	278.705	274.284	243.841	223.178	295.096	295.186	296.417	294.429	219.567	218.535	195.853
Take 08	245.633	247.203	247.099	218.029	196.760	279.528	276.010	276.566	276.442	245.245	218.339	296.251	292.473	295.706	298.740	219.569	218.909	195.098
Take 09	245.154	247.667	246.988	219.036	196.854	276.768	276.054	279.474	276.857	242.666	219.786	294.000	293.396	295.285	296.718	219.786	220.108	194.640
Take 10	248.047	248.353	247.705	221.551	195.971	275.908	276.973	276.224	275.983	247.603	225.500	291.641	292.221	295.248	296.217	221.150	221.586	198.310
Take 11	247.897	245.800	244.736	217.520	200.160	280.198	277.735	277.840	275.896	247.788	219.896	297.022	293.080	296.411	299.509	220.986	219.396	197.869
Take 12	246.999	248.851	245.830	219.846	196.084	279.406	276.341	280.630	275.297	248.429	217.168	296.989	292.735	297.590	292.699	220.500	220.068	195.096
Take 13	247.136	247.479	245.600	219.036	195.897	277.860	277.071	277.546	275.143	245.249	225.350	297.840	292.780	296.978	294.918	220.545	221.486	193.748
Take 14	245.821	244.986	244.012	219.162	198.000	274.398	275.514	277.677	275.543	242.274	214.829	293.720	292.240	295.781	293.359	219.485	220.045	196.000
Take 15	247.558	244.667	244.966	218.456	196.995	278.471	276.465	276.301	276.511	245.462	219.670	295.973	293.730	296.000	295.892	218.840	220.239	195.195
Take 16	245.380	242.826	248.072	218.012	192.693	280.873	272.950	279.239	275.291	245.032	215.617	293.419	291.531	298.639	296.763	218.998	219.217	195.850
Take 17	247.397	245.246	245.595	219.919	195.597	273.521	272.859	274.169	272.742	246.561	220.957	288.880	290.937	298.221	297.103	218.961	218.336	194.090
Take 18	245.030	244.478	245.689	218.039	194.328	278.258	274.971	274.799	273.288	242.865	219.428	284.493	291.727	296.604	296.312	218.062	220.776	195.710
Take 19	243.482	243.242	245.282	213.874	194.551	277.415	273.090	274.710	273.269	246.194	219.445	294.950	290.413	296.666	295.265	219.690	219.065	194.061
Take 20	248.218	241.810	244.218	224.524	197.012	274.682	275.260	277.614	277.391	248.240	229.305	293.147	290.076	314.069	297.953	219.707	221.891	193.889
Take 21	246.660	248.151	245.658	215.029	195.282	277.028	274.742	275.686	272.090	245.000	219.084	302.172	290.709	299.303	295.157	219.866	219.593	196.948
Ten 2 AVERAGE	246.474	246.193	246.171	218.861	196.036	277.585	275.486	277.338	275.283	245.776	220.904	294.294	292.671	297.760	296.015	219.753	219.935	195.626
Cents RF+3rds	-3.782	-5.751	-5.911	-9.487	-0.156	2.012	-11.125	0.474	-12.400	-8.688	6.600	3.206	-6.365	23.479	13.304	-2.443	-1.012	-3.783
Cents RF-3rds	0.127	-1.842	-2.002	-5.578	3.753	5.921	-7.216	4.382	-8.491	-4.779	10.508	7.115	-2.456	27.387	17.212	1.465	2.897	0.125
Just Int I	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Just Int II	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Pythagorean	5.865	5.865	5.865	1.955	-1.955	9.775	9.775	9.775	9.775	5.865	1.955	0.000	0.000	0.000	0.000	1.955	1.955	-1.955
Meantone	-10.264	-10.264	-10.264	-3.421	-29.219	-17.108	-17.108	-17.108	-17.108	-10.264	-3.421	0.000	0.000	0.000	0.000	-3.421	-3.421	3.422
Take 01	246.720	246.996	247.544	216.393	194.722	279.853	277.550	275.460	277.146	246.218	215.069	292.266	295.727	298.207	295.228	219.702	217.819	193.414
Take 02																		
Take 03	243.392	245.484	245.727	216.708	194.343	275.157	275.197	272.971	274.843	246.025	222.209	289.079	290.873	295.527	292.633	219.883	220.700	192.728
Take 04	245.904	245.341	246.154	219.251	196.763	275.024	273.630	274.544	276.393	247.034	224.120	293.550	293.476	295.112	293.146	219.049	219.232	191.420
Take 05																		
Take 06	244.014	243.233	243.267	219.246	194.883	272.181	272.576	275.353	274.901	244.197	215.272	292.791	289.435	292.503	292.906	218.293	218.796	191.887
Take 07	244.953	246.369	245.166	218.159	196.257	275.331	273.507	275.358	276.759	245.941	218.317	292.481	291.626	300.468	291.611	218.228	219.877	193.396
Take 08	243.395	0.000	246.105	214.914	191.950	271.281	272.828	273.811	272.131	245.827	222.054	293.796	288.145	299.510	291.683	217.561	218.739	190.205
Take 09	243.188	242.929	245.201	217.742	193.092	272.053	273.839	274.944	273.499	245.494	220.037	291.703	289.830	293.161	292.850	218.774	220.057	193.349
Take 10	245.740	246.094	246.247	217.790	193.244	276.310	274.053	276.421	276.010	247.511	220.577	291.777	291.332	294.770	293.497	219.215	220.207	194.200
Take 11	243.975	243.633	243.353	218.747	198.071	277.275	274.836	275.678	274.490	244.881	218.547	294.035	293.671	295.430	292.986	219.918	221.132	195.080
Take 12	244.879	244.712	245.974	216.290	194.588	275.086	272.978	273.941	275.214	246.635	218.659	293.146	292.764	293.441	292.937	218.451	217.297	192.519
Take 13	243.768	243.534	244.120	217.265	194.864	272.727	272.606	274.280	272.116	242.144	218.203	290.028	290.249	293.676	294.240	217.556	216.712	193.123
Take 14	243.815	244.367	243.487	216.634	192.988	274.400	273.233	274.513	274.736	242.647	215.313	291.768	290.313	292.393	293.820	218.021	217.970	194.226
Take 15	245.105	244.783	244.181	216.681	194.720	273.462	272.668	274.995	274.221	243.669	216.546	290.026	290.596	294.754	291.615	218.425	216.845	195.273
Take 16	242.198	243.207	242.798	214.235	194.027	274.333	274.334	273.840	269.215	244.768	217.375	290.348	290.837	296.405	289.437	217.699	216.677	192.068
Take 17	244.101	243.954	243.316	213.033	195.876	279.362	272.131	274.867	271.085	245.615	221.114	290.447	289.583	295.360	290.063	217.662	218.926	192.053
Take 18	243.695	244.811	241.190	212.639	193.280	275.129	272.084	273.609	271.318	240.867	212.107	282.864	290.911	289.642	291.836	215.851	216.168	193.066
Take 19	243.912	243.491	244.723	213.583	193.496	271.599	270.956	273.621	270.965	241.661	218.571	291.028	288.591	294.659	290.558	217.080	217.419	191.392
Take 20	244.168	242.018	239.762	213.911	194.894	270.801	269.308	274.855	275.614	240.285	218.630	300.143	295.201	296.522	293.168	217.376	218.225	192.492

Take 21	243.515	243.340	243.521	214.570	194.151	271.570	272.423	275.310	272.077	238.741	211.196	289.558	289.002	292.759	290.294	216.994	217.389	191.837
Ten 3 AVERAGE	244.234	244.350	244.307	216.200	194.537	274.365	273.197	274.651	273.828	244.219	218.101	291.623	291.166	294.963	292.343	218.197	218.431	192.828
Cents RF+3rds	-19.588	-18.764	-19.065	-30.665	-13.445	-18.185	-25.573	-16.381	-21.577	-19.690	-15.506	-12.576	-15.289	7.140	-8.309	-14.745	-12.889	-28.725
Cents RF-3rds	-15.679	-14.855	-15.157	-26.756	-9.536	-14.276	-21.664	-12.473	-17.668	-15.782	-11.598	-8.668	-11.380	11.049	-4.400	-10.837	-8.980	-24.816
Just Int I	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Just Int II	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Pythagorean	5.865	5.865	5.865	1.955	-1.955	9.775	9.775	9.775	9.775	5.865	1.955	0.000	0.000	0.000	0.000	1.955	1.955	-1.955
Meantone	-10.264	-10.264	-10.264	-3.421	-29.219	-17.108	-17.108	-17.108	-17.108	-10.264	-3.421	0.000	0.000	0.000	0.000	-3.421	-3.421	3.422
Take 01	244.785	249.013	246.025	220.903	197.534	282.240	276.045	280.693	276.434	246.228	222.727	294.020	293.197	301.504	295.761	220.934	223.019	194.949
Take 02																		
Take 03	246.250	245.854	246.632	219.087	197.847	283.400	277.165	279.265	278.409	244.311	222.463	296.238	294.192	295.152	289.603	221.384	221.467	194.260
Take 04	245.538	245.237	247.381	216.278	197.015	282.984	276.946	280.511	278.163	249.976	224.796	296.447	289.431	294.870	289.395	217.772	219.109	193.565
Take 05																		
Take 06	243.337	245.986	246.202	222.036	195.990	277.936	274.340	276.957	272.059	243.338	218.452	294.552	292.176	294.408	293.258	219.802	220.602	197.440
Take 07	245.391	247.799	245.643	220.947	196.865	278.070	275.702	279.778	276.357	245.298	222.665	299.917	289.691	293.775	292.637	219.695	219.368	196.437
Take 08	247.377	247.341	249.153	220.109	196.806	282.190	276.661	282.066	276.214	247.545	221.119	299.168	297.516	297.502	293.470	220.014	223.150	196.381
Take 09	245.585	245.743	247.361	219.088	197.066	278.802	275.840	277.941	276.097	246.552	226.194	293.663	293.509	299.063	291.491	221.019	220.292	197.350
Take 10	246.427	246.475	245.535	221.511	199.644	278.860	276.556	280.121	275.887	245.855	222.054	294.327	268.622	301.222	295.105	220.389	223.105	194.351
Take 11	246.157	244.305	245.482	219.244	199.132	283.439	276.976	279.991	275.780	246.764	223.669	295.758	296.492	294.880	286.464	221.971	223.303	197.048
Take 12	245.661	248.353	247.980	219.403	199.562	280.212	276.163	277.065	280.023	249.139	223.150	291.965	294.284	293.844	291.949	218.871	222.659	195.269
Take 13	246.032	246.900	248.536	219.363	198.957	278.068	276.438	276.660	276.059	244.228	217.749	293.187	295.570	297.386	294.983	220.229	221.608	194.456
Take 14	243.861	245.256	243.453	218.967	195.710	276.502	275.794	276.722	271.492	243.743	223.001	291.841	289.671	293.720	290.132	220.124	219.846	194.492
Take 15	245.468	247.563	245.570	218.199	196.919	278.631	274.838	277.474	275.839	247.658	222.976	291.469	289.847	295.784	293.293	219.873	219.897	195.867
Take 16	245.757	243.986	245.286	219.214	196.353	278.128	275.810	280.849	274.115	246.685	218.828	291.659	292.440	292.777	292.714	220.432	218.964	196.033
Take 17	244.703	245.801	244.587	215.854	194.786	276.292	275.235	274.197	274.205	248.383	222.974	293.960	293.620	295.191	292.330	220.048	220.517	194.682
Take 18	245.239	243.873	245.443	218.397	198.516	281.906	276.003	277.931	276.520	244.495	215.929	293.807	293.829	295.587	294.662	220.073	220.267	194.221
Take 19	245.700	244.909	245.295	218.636	195.261	278.984	276.237	279.301	273.750	245.344	218.023	292.850	294.655	295.911	291.754	219.553	221.907	196.036
Take 20	245.858	243.778	246.137	220.434	194.771	283.276	276.898	279.768	275.088	249.217	222.019	298.207	296.819	298.997	297.009	221.001	222.829	196.633
Take 21	246.057	245.066	245.106	216.597	194.076	279.011	275.695	272.325	272.382	245.049	223.858	304.138	295.145	300.098	297.906	219.195	220.163	195.095
Ten 4 AVERAGE	245.536	245.960	246.148	219.172	196.990	279.944	276.071	278.401	275.520	246.306	221.718	295.114	292.142	296.404	292.838	220.125	221.162	195.503
Cents RF+3rds	-10.380	-7.393	-6.072	-7.025	8.245	16.663	-7.457	7.095	-10.915	-4.961	12.972	8.027	-9.495	15.575	-5.380	0.488	8.622	-4.869
Cents RF-3rds	-6.471	-3.485	-2.163	-3.117	12.154	20.571	-3.548	11.004	-7.006	-1.052	16.881	11.936	-5.586	19.484	-1.472	4.397	12.530	-0.960
Just Int I	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Just Int II	-15.641	-15.641	-15.641	1.955	-1.955	-11.731	-11.731	-11.731	-11.731	-15.641	1.955	0.000	0.000	0.000	-27.264	1.955	1.955	-1.955
Pythagorean	5.865	5.865	5.865	1.955	-1.955	9.775	9.775	9.775	9.775	5.865	1.955	0.000	0.000	0.000	0.000	1.955	1.955	-1.955
Meantone	-10.264	-10.264	-10.264	-3.421	-29.219	-17.108	-17.108	-17.108	-17.108	-10.264	-3.421	0.000	0.000	0.000	0.000	-3.421	-3.421	3.422

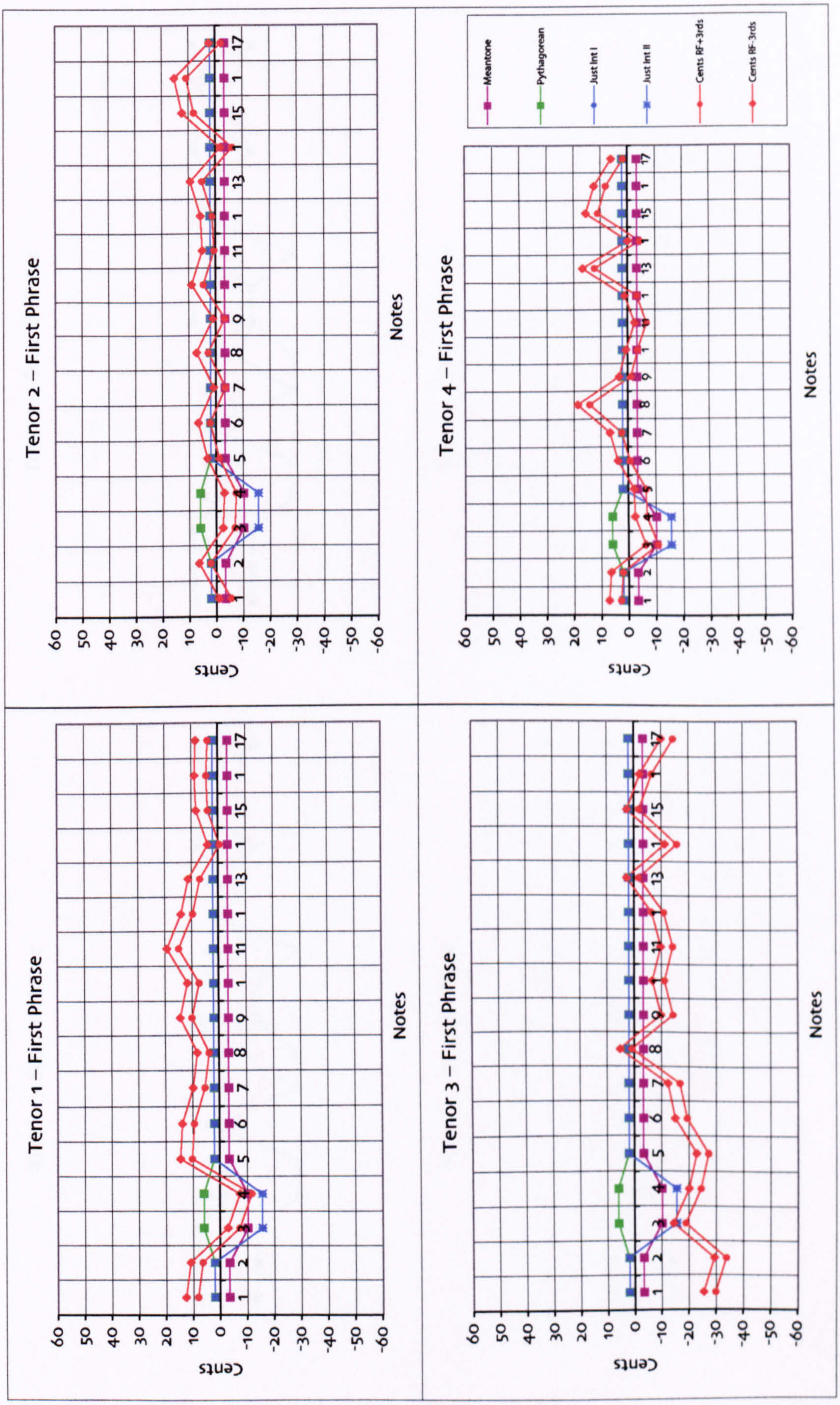
Fifth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14
Take 01	264.575	299.051	265.606	250.937	297.997	280.618	250.606	222.197	219.562	199.497	222.628	198.112	197.446	187.334
Take 02														
Take 03	261.208	296.670	261.287	247.902	294.110	277.658	248.057	222.459	221.373	198.761	221.625	196.006	196.508	187.060
Take 04	261.164	294.139	263.001	249.061	293.930	277.525	247.676	222.706	222.345	199.777	221.129	195.525	195.950	187.445
Take 05														
Take 06	259.195	291.097	261.897	248.593	293.240	274.605	243.902	220.689	220.879	196.816	220.271	194.999	196.471	187.389
Take 07	263.738	293.532	264.691	250.138	293.068	275.602	245.132	220.211	219.142	195.985	219.550	194.697	195.423	185.232
Take 08	257.137	293.068	260.864	248.019	291.177	273.925	246.508	220.382	220.156	197.092	219.140	194.538	195.379	186.354
Take 09	263.249	294.763	262.698	248.326	292.447	274.986	245.321	220.874	219.191	196.839	219.674	196.285	195.858	185.862
Take 10	264.814	294.695	262.484	250.789	292.229	278.937	246.936	220.768	221.644	200.342	222.105	198.942	196.430	186.832
Take 11	265.063	293.728	262.767	251.460	291.374	271.440	246.628	222.170	218.199	198.187	222.679	197.006	195.523	188.718
Take 12	263.212	294.648	262.930	250.179	294.954	278.789	251.494	223.742	220.744	201.334	221.836	196.242	195.601	186.057
Take 13	262.223	293.163	260.154	249.060	292.028	274.226	247.524	223.591	221.897	198.993	220.970	195.028	195.306	187.021
Take 14	258.800	291.775	259.885	247.174	292.118	273.968	244.989	218.821	218.137	193.564	218.736	195.425	194.702	184.137
Take 15	261.191	292.333	262.922	250.608	290.071	274.828	246.670	221.301	220.406	197.088	218.718	194.978	194.092	185.327
Take 16	260.690	292.124	259.735	245.420	286.919	271.847	245.880	219.357	220.126	197.665	220.095	195.266	194.529	185.000

Take 17	260.786	292.126	260.196	246.122	290.683	276.688	244.082	218.788	221.156	196.946	220.336	193.819	194.695	185.148
Take 18	260.018	293.213	263.307	247.185	289.116	270.565	244.358	218.322	219.057	199.439	219.658	194.002	193.632	185.038
Take 19	261.360	293.075	259.400	245.070	291.369	272.643	242.292	218.650	220.345	197.340	219.904	195.228	196.270	185.290
Take 20	261.560	294.291	259.529	245.243	291.753	276.450	245.765	218.121	213.432	193.744	222.470	195.512	192.494	187.117
Take 21	261.951	295.198	261.059	245.495	289.703	272.222	244.726	221.450	219.391	199.232	221.043	193.359	193.662	186.245
Ten 1 AVERAGE	**261.681**	**293.826**	**261.811**	**248.252**	**292.015**	**275.133**	**246.239**	**220.768**	**219.852**	**197.823**	**220.661**	**195.525**	**195.262**	**186.242**
Cents RF+3rds	-3.722	-3.137	-2.859	5.072	-13.840	-16.937	-9.019	1.949	-5.256	11.963	1.110	-8.270	-10.601	7.526
Cents RF-3rds	-3.237	-2.653	-2.375	5.557	-13.355	-16.453	-8.534	2.434	-4.771	12.448	1.595	-7.785	-10.116	8.011
Just Int I	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Just Int II	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Pythagorean	-3.910	0.000	-3.910	5.865	0.000	9.775	5.865	1.955	1.955	-1.955	1.955	-1.955	-1.955	7.820
Meantone	6.843	0.000	6.843	-10.264	0.000	-17.108	-10.264	-3.421	-3.421	3.422	-3.421	3.422	3.422	-13.686
Take 01	263.128	296.382	263.063	247.130	295.426	279.094	248.337	220.493	221.998	196.324	222.443	197.680	196.329	187.018
Take 02														
Take 03	264.040	294.866	260.966	249.653	290.936	280.422	247.341	219.015	221.798	196.508	220.402	195.925	197.732	185.785
Take 04	263.229	296.077	264.850	251.040	288.962	276.845	248.905	224.956	222.599	196.703	221.032	196.970	198.053	186.579
Take 05														
Take 06	264.510	294.332	263.936	248.963	292.075	276.211	245.009	221.141	221.559	196.017	220.474	196.339	197.934	185.420
Take 07	260.184	296.032	263.943	248.546	291.346	277.070	247.817	220.086	223.767	193.466	220.165	195.748	196.758	184.602
Take 08	265.974	296.358	263.230	247.336	290.900	277.082	248.246	220.441	220.196	193.905	220.251	195.964	198.310	184.712
Take 09	263.739	295.426	262.270	248.673	293.238	277.337	247.736	220.744	219.646	194.376	220.581	196.200	196.733	184.629
Take 10	265.727	295.859	262.282	247.286	291.556	277.889	248.205	221.282	221.843	196.631	221.364	197.337	196.685	185.856
Take 11	262.543	295.979	263.772	252.926	298.319	281.640	249.045	220.718	218.570	193.951	221.659	196.888	195.706	186.631
Take 12	261.393	294.623	260.274	245.971	292.575	278.327	248.267	219.611	219.571	197.490	220.772	195.937	196.589	185.531
Take 13	260.388	295.963	263.966	250.091	291.897	278.136	248.023	217.609	220.624	197.113	220.207	195.968	195.722	186.054
Take 14	263.357	294.169	259.682	246.640	290.158	274.212	245.795	219.618	218.897	194.862	218.814	195.456	196.624	184.320
Take 15	262.745	294.021	262.270	247.983	290.597	272.956	246.646	218.432	218.290	193.964	219.454	195.206	196.649	185.433
Take 16	259.038	292.016	256.678	247.405	294.118	276.982	244.341	218.265	217.410	195.419	219.527	194.680	198.117	184.534
Take 17	267.539	291.619	261.150	246.742	292.935	278.252	244.009	219.716	220.893	194.683	219.837	193.895	195.389	184.514
Take 18	261.449	293.164	256.204	248.036	286.022	272.183	244.129	220.069	220.559	193.970	219.628	194.747	193.712	183.938
Take 19	261.617	294.155	260.200	246.192	293.687	278.253	248.673	219.421	220.681	194.947	220.500	196.337	196.269	185.272
Take 20	265.147	296.866	259.980	248.814	289.529	280.680	246.301	218.437	223.598	195.811	220.574	196.151	197.633	184.936
Take 21	261.695	294.994	259.417	244.574	287.747	274.440	245.476	220.934	218.597	192.968	218.910	195.474	197.098	184.759
Ten 2 AVERAGE	**263.023**	**294.890**	**261.481**	**248.105**	**291.685**	**277.264**	**246.963**	**220.052**	**220.584**	**195.216**	**220.347**	**195.942**	**196.739**	**185.291**
Cents RF+3rds	5.138	3.119	-5.046	4.053	-15.795	-3.580	-3.935	-3.678	0.503	-11.004	-1.358	-4.577	2.450	-1.343
Cents RF-3rds	5.622	3.604	-4.561	4.538	-15.310	-3.095	-3.450	-3.193	0.988	-10.519	-0.873	-4.092	2.935	-0.858
Just Int I	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Just Int II	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Pythagorean	-3.910	0.000	-3.910	5.865	0.000	9.775	5.865	1.955	1.955	-1.955	1.955	-1.955	-1.955	7.820
Meantone	6.843	0.000	6.843	-10.264	0.000	-17.108	-10.264	-3.421	-3.421	3.422	-3.421	3.422	3.422	-13.686
Take 01	260.647	292.933	262.862	249.829	290.146	275.503	246.682	221.514	220.999	197.145	218.698	194.709	195.113	185.256
Take 02														
Take 03	259.110	290.367	258.186	247.839	293.316	277.181	248.266	216.021	218.023	194.493	218.425	194.499	195.509	184.879
Take 04	261.692	293.197	262.819	248.393	292.461	274.996	246.532	217.792	223.103	198.385	218.843	194.549	197.790	184.973
Take 05														
Take 06	263.858	295.198	261.425	245.616	290.435	271.832	245.089	217.123	222.680	199.071	219.856	194.650	198.155	185.373
Take 07	261.716	289.609	260.332	248.032	290.121	275.800	247.059	217.905	218.378	195.666	219.178	193.670	195.891	184.444
Take 08	258.793	291.411	260.239	248.311	289.951	272.698	246.541	217.231	219.668	197.175	219.590	193.510	195.298	184.113
Take 09	263.458	294.860	262.340	246.731	290.055	274.772	247.085	218.095	218.327	195.386	220.046	192.428	194.498	184.637
Take 10	264.342	294.474	263.917	245.523	290.678	278.023	246.867	218.325	220.500	195.902	220.241	194.848	196.098	184.792
Take 11	264.936	292.268	261.803	246.442	293.664	277.751	244.715	216.780	222.540	196.600	220.111	196.687	194.685	185.456
Take 12	264.600	295.798	261.783	247.481	294.874	278.686	245.098	217.055	217.197	194.702	218.827	193.613	197.138	184.683
Take 13	264.598	295.359	262.846	246.287	293.084	277.704	244.277	216.427	217.231	195.349	219.125	193.660	197.946	185.850
Take 14	261.314	291.287	259.050	242.058	287.221	270.426	243.948	214.702	216.572	193.482	216.748	192.820	195.637	182.929

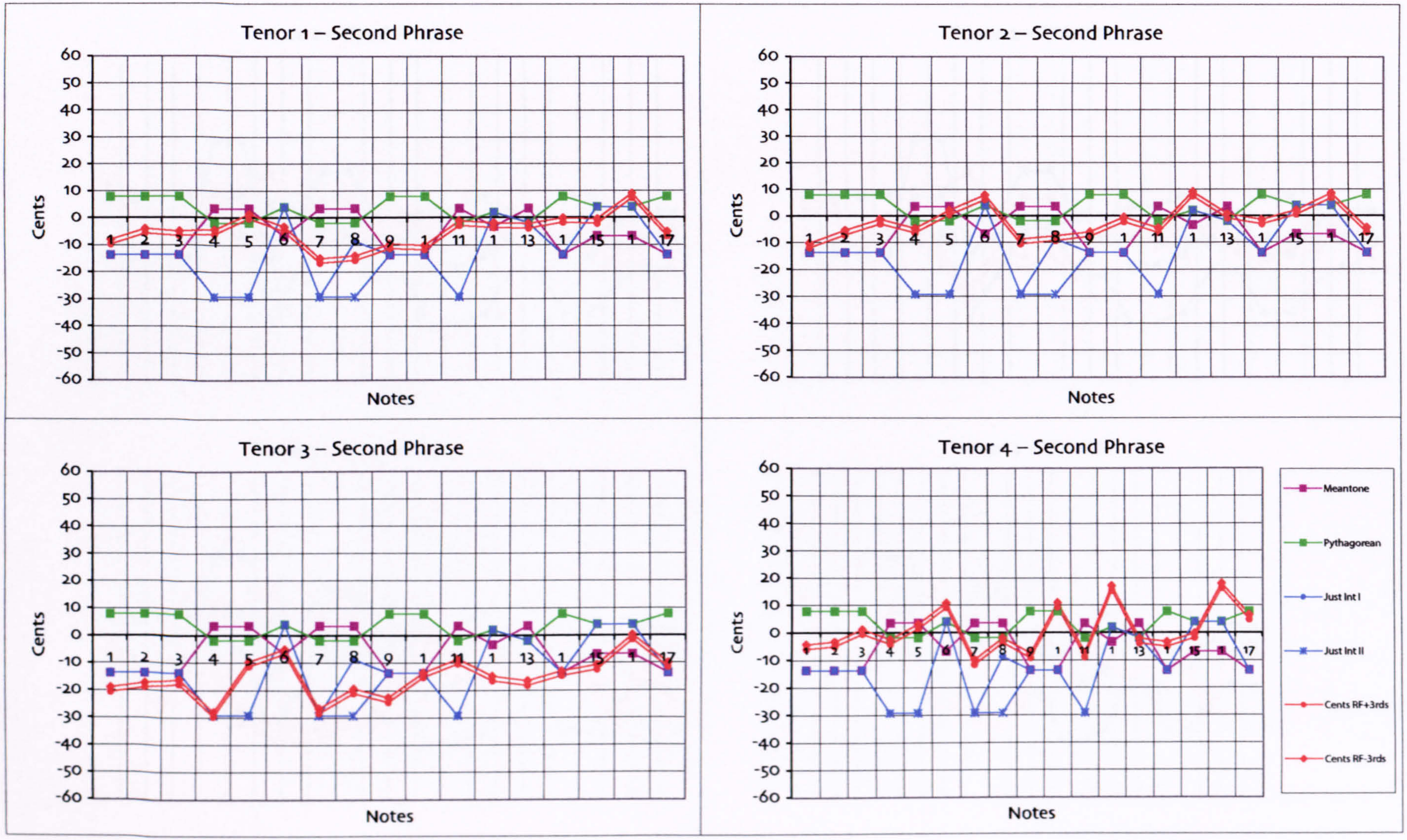
Take 15	264.212	292.944	261.234	246.604	291.719	274.997	245.115	216.608	218.356	195.309	218.659	192.887	195.376	184.822
Take 16	264.277	290.679	259.314	245.524	287.273	275.941	246.058	218.556	221.213	192.539	217.473	191.945	195.348	183.546
Take 17	268.549	290.361	260.621	242.234	287.490	272.345	243.552	213.511	217.345	195.061	217.245	191.079	195.479	184.040
Take 18	263.229	293.481	259.034	245.319	286.949	275.509	242.357	216.421	217.926	192.484	217.415	193.059	196.135	183.494
Take 19	264.727	290.880	260.125	244.764	285.014	274.352	243.230	214.425	218.807	195.933	218.829	194.022	195.857	184.095
Take 20	264.262	292.630	261.435	250.046	289.277	272.002	240.689	215.739	218.144	196.113	217.245	193.811	194.842	183.481
Take 21	264.589	295.387	264.391	250.337	285.987	271.208	243.499	216.225	215.824	196.304	218.260	192.118	195.621	184.647
Ten 3 AVERAGE	**263.311**	**292.796**	**261.250**	**246.704**	**289.985**	**274.828**	**245.087**	**216.866**	**219.096**	**195.637**	**218.674**	**193.609**	**195.917**	**184.501**
Cents RF+3rds	7.031	-9.216	-6.571	-5.756	-25.917	-18.858	-17.136	-28.927	-11.212	-7.279	-14.550	-25.319	-4.803	-8.741
Cents RF-3rds	7.515	-8.732	-6.086	-5.271	-25.432	-18.373	-16.651	-28.442	-10.727	-6.794	-14.065	-24.834	-4.318	-8.256
Just Int I	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Just Int II	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Pythagorean	-3.910	0.000	-3.910	5.865	0.000	9.775	5.865	1.955	1.955	-1.955	1.955	-1.955	-1.955	7.820
Meantone	6.843	0.000	6.843	-10.264	0.000	-17.108	-10.264	-3.421	-3.421	3.422	-3.421	3.422	3.422	-13.686
Take 01	263.059	294.410	262.353	247.143	290.727	272.887	246.646	218.762	218.317	193.985	219.431	195.232	196.624	185.405
Take 02														
Take 03	262.511	294.958	264.059	245.650	295.668	272.527	243.554	219.032	222.356	191.873	219.161	196.540	197.337	186.268
Take 04	263.400	295.888	266.286	248.730	291.430	278.218	248.937	221.398	224.633	195.502	221.145	197.455	199.846	186.932
Take 05														
Take 06	260.157	295.624	262.534	248.852	292.548	275.787	248.127	219.236	225.121	192.849	220.045	195.966	199.884	187.227
Take 07	261.285	295.900	264.756	247.010	293.669	274.540	246.868	218.790	221.985	193.823	220.264	196.153	197.563	186.948
Take 08	260.695	294.871	262.481	247.167	296.016	280.226	246.754	216.682	225.207	194.454	220.693	196.715	198.849	187.487
Take 09	266.826	295.526	264.127	246.797	291.780	276.413	245.814	220.571	225.348	196.601	219.890	196.213	198.985	187.404
Take 10	264.303	293.420	262.758	248.430	293.162	278.222	247.226	220.974	225.315	198.623	220.083	197.152	198.455	186.939
Take 11	263.786	296.223	265.684	249.013	295.016	276.137	245.671	220.605	224.747	197.166	222.979	197.957	199.874	186.924
Take 12	269.462	293.135	264.761	249.745	293.359	278.395	246.946	219.633	223.462	193.081	220.222	195.106	198.247	186.610
Take 13	265.738	297.133	266.221	252.505	299.608	282.467	248.156	220.542	222.857	197.278	220.346	198.276	199.082	186.836
Take 14	260.871	291.476	259.979	244.478	286.830	273.760	243.691	216.959	221.030	195.094	218.569	194.089	195.459	184.784
Take 15	264.422	293.196	261.370	248.379	292.754	275.087	243.646	218.674	224.509	196.000	221.074	195.582	196.910	185.729
Take 16	262.061	293.560	262.705	245.044	291.286	276.748	243.832	218.737	221.948	194.246	218.912	194.951	196.956	185.926
Take 17	264.184	295.061	260.082	245.879	291.459	276.021	245.281	218.509	220.690	196.304	219.516	193.922	196.709	186.053
Take 18	260.742	294.317	262.108	245.070	290.410	275.108	244.221	218.229	220.842	193.635	220.168	194.649	195.318	186.270
Take 19	261.708	295.518	260.390	245.455	289.963	277.134	243.387	219.144	222.117	192.890	220.026	194.892	196.398	185.695
Take 20	267.922	296.468	267.374	251.124	294.310	277.148	243.194	220.007	221.961	196.830	220.800	195.679	198.328	185.926
Take 21	270.128	297.191	264.911	251.238	294.996	280.327	245.347	218.013	225.763	196.937	219.438	197.134	199.680	186.142
Ten 4 AVERAGE	**263.856**	**294.941**	**263.418**	**247.774**	**292.894**	**276.692**	**245.647**	**219.184**	**223.064**	**195.114**	**220.145**	**195.982**	**197.921**	**186.395**
Cents RF+3rds	10.609	3.420	7.733	1.739	-8.635	-7.153	-13.185	-10.519	19.856	-11.907	-2.943	-4.223	12.821	8.945
Cents RF-3rds	11.094	3.905	8.217	2.224	-8.150	-6.668	-12.700	-10.034	20.341	-11.422	-2.458	-3.738	13.306	9.430
Just Int I	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Just Int II	-31.174	0.000	10.821	5.865	-27.264	-11.731	5.865	1.955	1.955	-1.955	1.955	-29.219	-29.219	-13.686
Pythagorean	-3.910	0.000	-3.910	5.865	0.000	9.775	5.865	1.955	1.955	-1.955	1.955	-1.955	-1.955	7.820
Meantone	6.843	0.000	6.843	-10.264	0.000	-17.108	-10.264	-3.421	-3.421	3.422	-3.421	3.422	3.422	-13.686

11.6 - The BBC Singers tenors' results



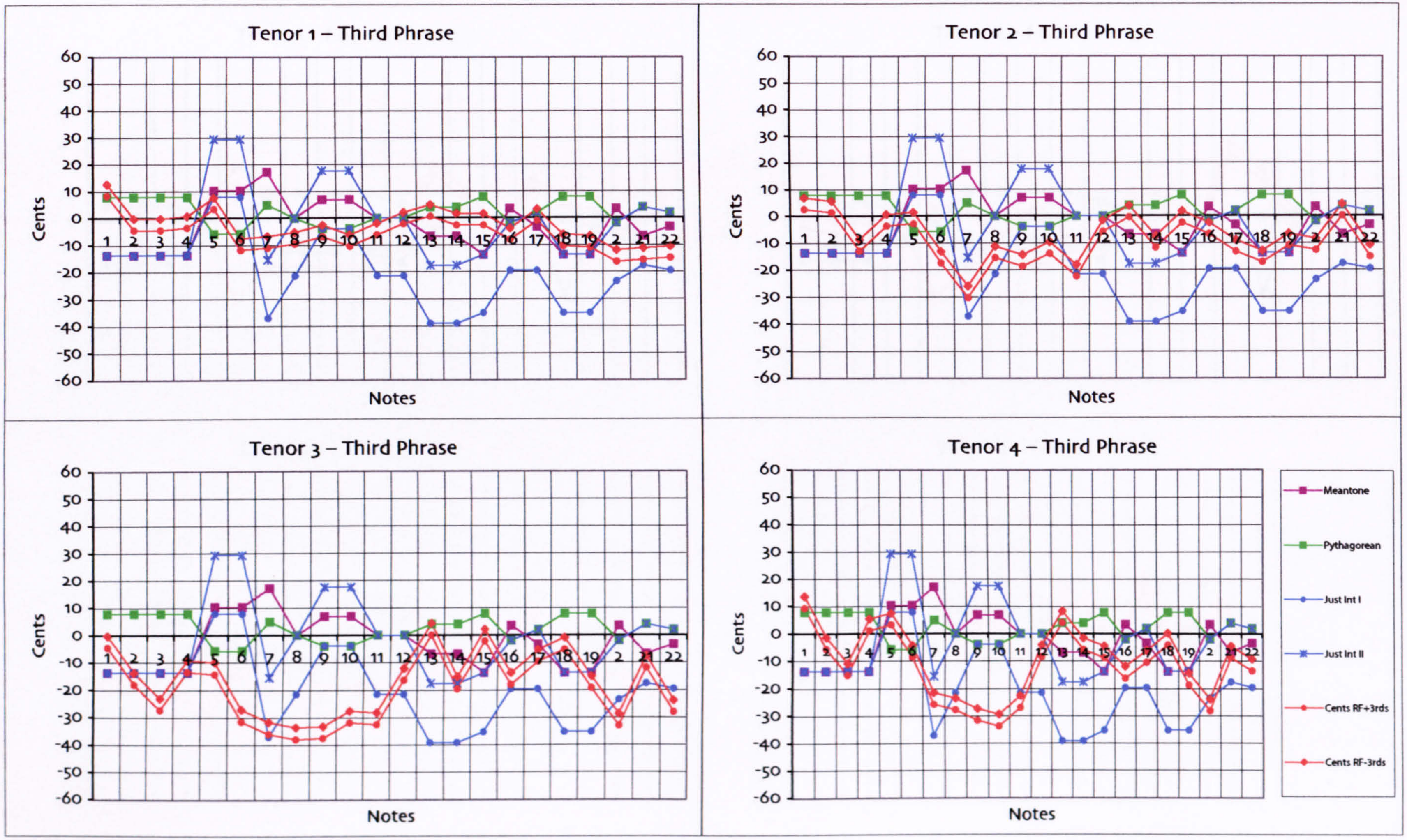
11.6A - THE BBC SINGERS TENORS' CHARTS – PHRASE 1

11.6A - THE BBC SINGERS TENORS' CHARTS – PHRASE 1


Tenor 1 – Second Phrase
Tenor 2 – Second Phrase
Tenor 3 – Second Phrase
Tenor 4 – Second Phrase
Cents
Notes
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
1 2 3 4 5 6 7 8 9 1 11 1 13 1 15 1 17
Meantone
Pythagorean
Just Int I
Just Int II
Cents RF+3rds
Cents RF-3rds

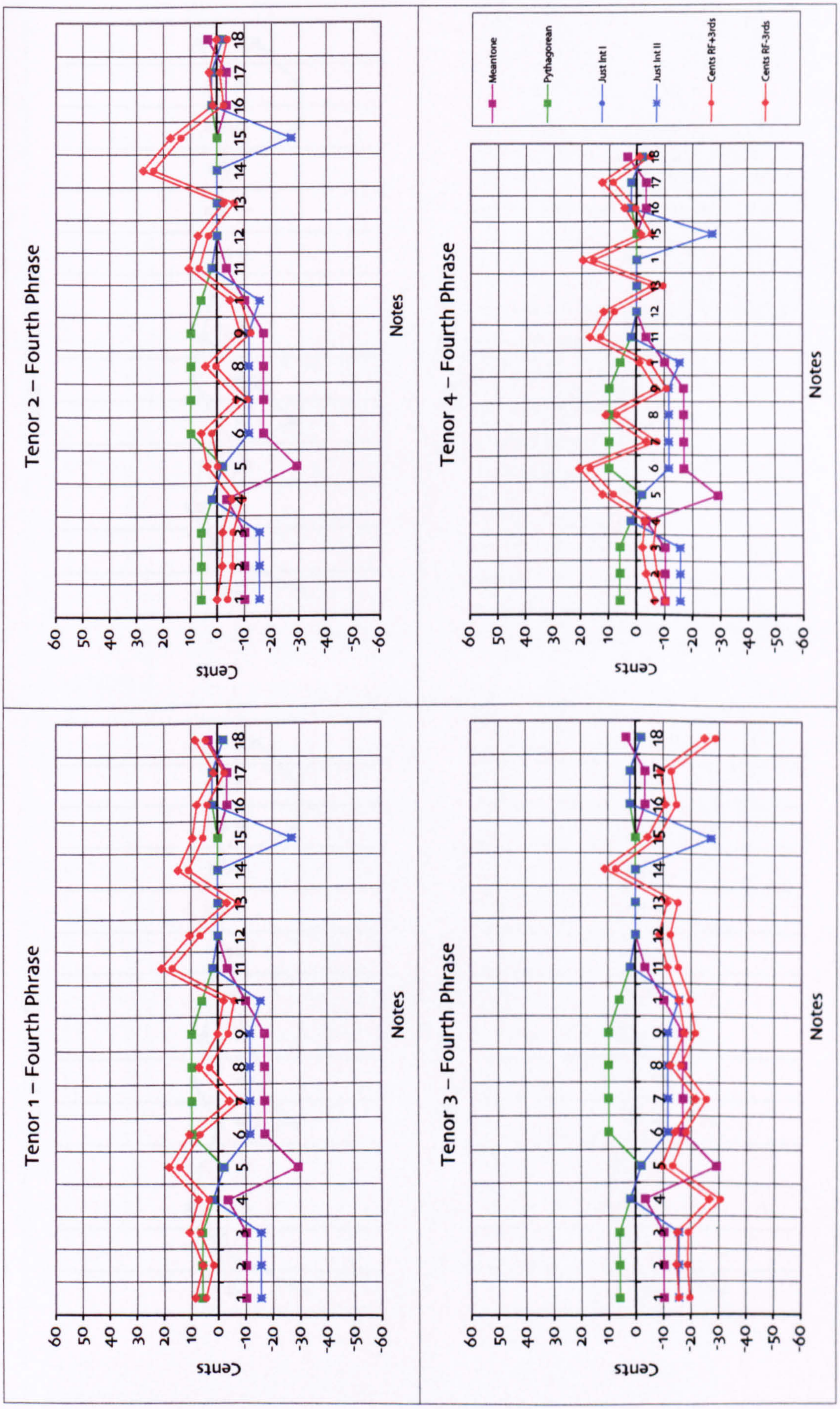


11.6B - THE BBC SINGERS TENORS' CHARTS – PHRASE 2


Tenor 1 – Third Phrase
Tenor 2 – Third Phrase
Tenor 3 – Third Phrase
Tenor 4 – Third Phrase
Cents
Notes
Meantone
Pythagorean
Just Int I
Just Int II
Cents RF+3rds
Cents RF-3rds

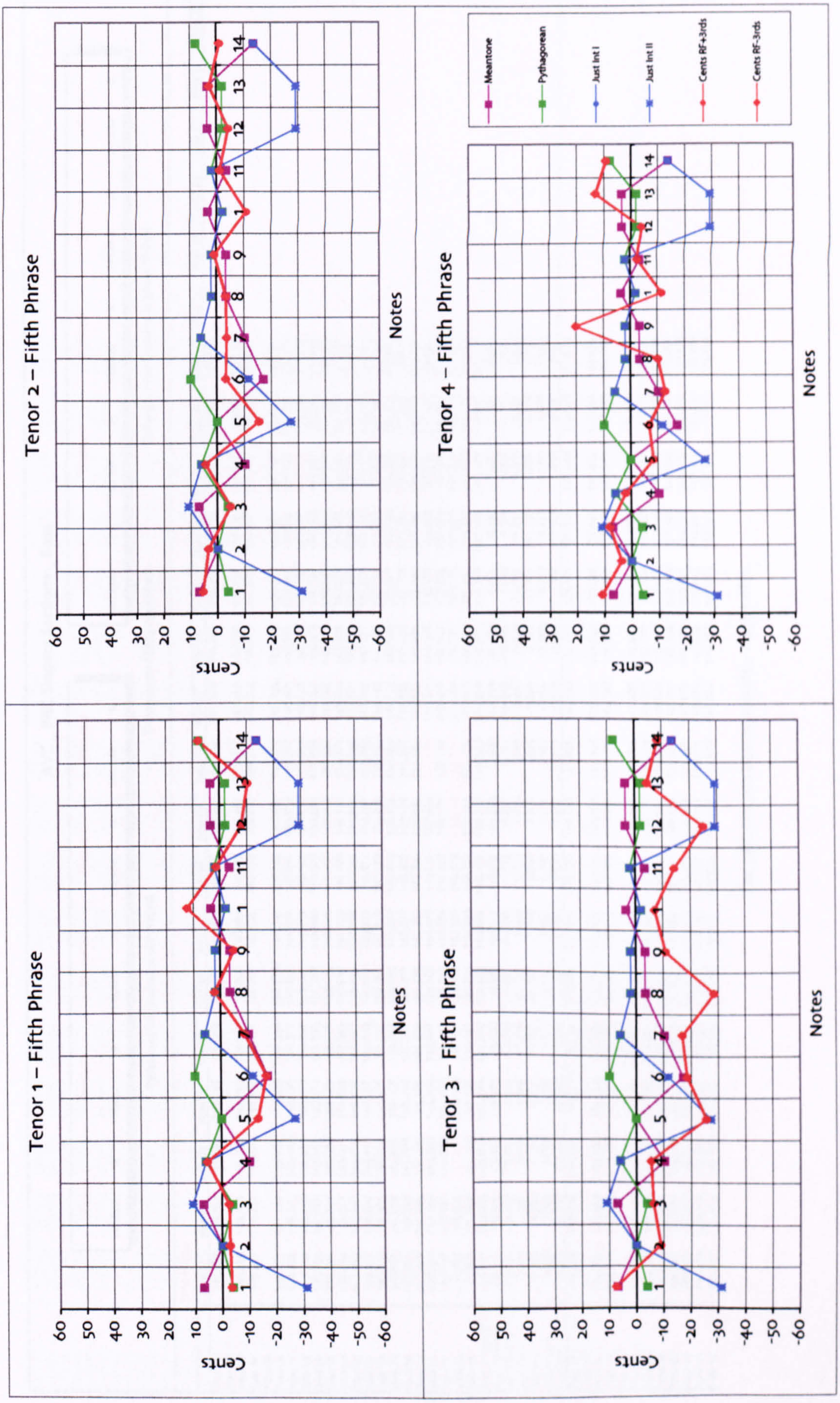


11.6c - The BBC Singers tenors' charts – Phrase 3



11.6D - THE BBC SINGERS TENORS' CHARTS – PHRASE 4

11.6D - THE BBC SINGERS TENORS' CHARTS – PHRASE 4



11.6E - THE BBC SINGERS TENORS' CHARTS – PHRASE 5

11.6E - THE BBC SINGERS TENORS' CHARTS – PHRASE 5

AVC _ BBC Singers Sections _ Bass

Reference Frequencies with Thirds

Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
147.030	D	110.057	A	110.428	A	146.875	D	147.179	D

Frequency Measurements

Reference Frequencies without Thirds

Phrase 1		Phrase 2		Phrase 3		Phrase 4		Phrase 5	
146.658	D	109.949	A	110.156	A	146.543	D	147.138	D

First Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
Take 01	143.299	144.561	144.569	144.862	135.568	136.631	144.487	146.370	108.864	109.403	141.374	144.200	136.943	137.420	146.988	147.145	111.159						
Take 02																							
Take 03	146.249	143.725	145.128	146.463	136.748	137.329	145.954	147.182	109.462	113.517	147.492	144.278	137.756	137.091	144.522	146.020	108.858						
Take 04	146.567	144.511	144.477	144.647	136.677	137.307	146.356	149.253	108.298	106.635	145.778	148.511	137.530	138.150	146.549	148.526	110.097						
Take 05																							
Take 06	146.927	145.492	145.060	145.358	137.306	138.558	144.245	146.962	109.015	109.075	147.763	145.136	139.145	138.507	148.082	146.948	108.390						
Take 07	148.039	146.876	145.575	146.938	136.971	137.284	144.979	146.896	109.889	110.392	144.460	143.346	138.547	140.387	146.123	145.836	108.965						
Take 08	143.448	144.330	145.012	144.993	136.568	139.005	146.079	145.129	109.930	109.019	145.720	146.210	139.333	137.987	146.912	144.545	109.397						
Take 09	146.564	147.377	146.662	150.374	137.132	138.338	143.690	147.370	108.059	110.776	146.303	144.072	140.487	136.525	146.184	147.303	109.998						
Take 10	143.509	146.724	145.989	144.381	136.079	138.212	143.383	147.208	108.997	107.157	144.767	143.422	138.888	139.076	149.217	145.191	108.095						
Take 11	147.854	145.313	145.001	143.680	137.163	138.694	145.710	144.768	108.722	112.371	146.358	145.900	140.439	139.152	148.039	147.707	111.218						
Take 12	142.473	145.858	146.005	146.915	136.387	138.922	146.978	147.042	111.852	110.897	148.279	145.419	141.195	139.255	147.716	145.614	110.059						
Take 13	146.624	146.309	144.495	144.237	138.049	140.374	145.273	146.927	110.286	109.949	141.849	147.525	139.630	137.946	147.938	148.229	111.231						
Take 14	145.920	142.801	146.142	145.473	138.412	139.895	142.680	145.580	110.248	109.146	146.347	144.463	137.757	139.679	146.952	147.700	110.459						
Take 15	145.481	144.254	145.545	146.309	136.265	139.036	144.815	145.705	110.737	110.434	148.721	145.996	143.071	138.859	148.539	148.935	109.405						
Take 16	147.831	143.259	145.204	145.794	137.154	137.911	145.375	146.603	109.414	114.367	144.901	143.480	137.731	137.588	146.774	146.222	109.865						
Take 17	147.437	145.565	145.506	146.366	137.026	138.756	145.965	143.740	109.443	115.397	145.022	144.484	136.290	137.091	146.678	148.510	108.592						
Take 18	146.323	147.560	144.404	145.103	136.577	136.786	144.476	145.518	107.324	107.386	144.544	144.626	138.956	138.049	147.924	147.908	109.251						
Take 19	147.057	145.167	143.883	146.257	137.761	136.305	145.056	145.927	108.131	107.731	143.474	146.152	138.196	136.604	148.089	146.935	109.549						
Take 20	144.705	145.072	145.933	145.720	136.855	139.172	143.929	145.220	108.799	112.016	145.014	146.709	139.375	137.975	146.259	145.124	109.289						
Take 21	140.735	140.602	141.524	147.164	138.581	138.834	144.690	146.369	108.129	110.283	144.419	142.570	135.919	135.917	146.780	145.123	106.841						
Bass 1 AVERAGE	**145.634**	**145.019**	**145.059**	**145.844**	**137.015**	**138.282**	**144.954**	**146.304**	**109.242**	**110.313**	**145.399**	**145.079**	**138.799**	**138.066**	**147.172**	**146.817**	**109.511**						
Cents RF+3rds	-16.512	-23.840	-23.364	-14.018	-22.130	-6.197	-24.617	-8.569	-14.293	2.600	-19.304	-23.122	0.274	-8.896	1.675	-2.504	-10.031						
Cents RF-3rds	-12.136	-19.464	-18.988	-9.642	-17.754	-1.821	-20.241	-4.193	-9.917	6.977	-14.928	-18.746	4.650	-4.520	6.052	1.872	-5.655						
Just Int I	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995						
Just Int II	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995						
Pythagorean	0.000	0.000	0.000	0.000	9.775	9.775	0.000	0.000	1.955	1.955	0.000	0.000	9.775	9.775	0.000	0.000	1.955						
Meantone	0.000	0.000	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421	-3.421	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421						
Take 01	146.488	143.648	146.061	144.632	137.456	136.864	145.707	145.503	109.583	111.038	146.590	146.961	138.407	136.729	147.348	148.879	110.016						
Take 02																							
Take 03	146.030	145.865	145.653	143.262	136.533	136.605	145.132	145.159	109.826	111.393	146.705	146.026	138.088	137.883	147.277	148.669	109.635						
Take 04	147.815	147.699	146.762	146.584	138.265	139.005	146.063	147.895	109.572	111.073	146.290	146.454	141.502	138.669	145.971	147.445	109.271						
Take 05																							
Take 06	144.602	146.463	144.912	145.766	138.072	139.894	145.124	146.156	110.001	110.762	145.898	145.845	138.755	137.079	146.936	146.130	109.651						
Take 07	146.378	147.176	147.167	147.631	138.940	137.193	145.676	147.871	109.171	110.474	146.892	147.770	142.464	139.607	147.819	147.512	109.376						
Take 08	147.332	147.101	145.863	146.505	138.450	138.640	146.084	146.904	108.527	110.559	148.630	145.466	138.623	138.046	147.207	148.409	109.636						
Take 09	146.387	147.995	146.228	147.124	139.988	136.889	145.566	147.411	109.688	108.872	145.991	147.254	140.364	139.469	147.892	147.299	110.307						
Take 10	144.400	142.902	144.553	144.254	138.447	136.924	145.056	145.516	109.249	109.608	144.876	145.672	138.981	138.551	146.056	145.950	109.418						
Take 11	147.374	148.658	146.161	145.507	139.057	138.076	145.363	147.797	110.168	108.874	146.256	145.829	138.713	138.297	147.899	147.654	110.308						
Take 12	145.337	144.514	144.399	145.703	139.408	139.390	144.342	145.072	109.261	111.872	146.834	145.757	140.254	138.679	147.143	148.463	109.999						

Take 13	146.724	145.797	146.617	145.437	138.428	138.767	146.342	147.197	109.066	110.975	146.065	146.220	140.229	138.983	148.149	148.337	109.719
Take 14	144.652	144.668	144.665	144.842	137.110	139.739	146.122	146.546	108.973	110.533	145.309	145.620	139.500	138.473	146.650	147.558	109.603
Take 15	146.086	145.808	145.165	146.715	137.996	138.627	145.278	144.926	108.669	109.604	145.611	145.530	139.296	138.769	147.849	147.517	109.288
Take 16	145.213	145.737	145.985	144.221	137.473	138.033	144.143	146.220	108.883	110.410	147.198	145.830	139.932	139.467	148.093	147.549	109.164
Take 17	147.516	147.849	146.932	144.673	139.963	136.971	144.840	146.652	109.060	109.643	145.166	145.206	140.545	138.973	147.051	147.372	108.828
Take 18	144.565	145.001	144.999	144.979	137.505	138.182	145.085	147.839	109.196	109.413	145.497	146.494	138.795	137.914	146.390	146.179	108.726
Take 19	145.858	148.160	146.275	145.922	136.786	137.986	144.001	145.267	108.109	111.056	145.822	144.741	138.566	138.237	146.006	145.566	108.381
Take 20	146.020	145.092	144.398	144.666	138.236	138.796	145.547	144.901	108.768	112.413	145.427	144.505	138.849	138.605	147.271	146.798	108.781
Take 21	145.273	146.149	144.379	146.126	138.609	140.832	145.561	145.035	109.109	110.335	145.740	146.012	138.554	136.903	145.546	146.080	109.408
Bass 2 AVERAGE	**146.003**	**146.120**	**145.641**	**145.502**	**138.248**	**138.285**	**145.317**	**146.309**	**109.204**	**110.469**	**146.147**	**145.957**	**139.496**	**138.386**	**147.082**	**147.335**	**109.448**
Cents RF+3rds	-12.135	-10.741	-16.431	-18.075	-6.612	-6.154	-20.278	-8.507	-14.894	5.038	-10.422	-12.669	8.938	-4.890	0.614	3.593	-11.031
Cents RF-3rds	-7.759	-6.365	-12.055	-13.699	-2.236	-1.778	-15.902	-4.131	-10.518	9.415	-6.045	-8.293	13.314	-0.514	4.990	7.969	-6.655
Just Int I	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995
Just Int II	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995
Pythagorean	0.000	0.000	0.000	0.000	9.775	9.775	0.000	0.000	1.955	1.955	0.000	0.000	9.775	9.775	0.000	0.000	1.955
Meantone	0.000	0.000	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421	-3.421	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421
Take 01	145.648	148.184	148.241	147.072	139.954	140.854	147.767	148.135	110.645	110.392	146.613	146.774	141.696	140.618	150.492	148.036	109.881
Take 02																	
Take 03	146.493	147.630	145.307	145.987	138.741	141.676	147.021	147.514	109.562	111.348	147.892	145.472	140.801	138.521	147.672	147.160	109.424
Take 04	146.485	147.157	146.943	146.050	139.732	139.241	147.170	148.080	110.945	112.390	146.709	146.213	139.080	140.626	148.128	148.507	110.580
Take 05																	
Take 06	145.810	145.723	145.276	143.709	136.230	135.502	145.140	146.372	109.203	110.174	145.985	144.031	141.977	0.000	147.960	147.220	109.188
Take 07	147.278	147.170	146.534	147.303	138.073	140.411	147.068	147.378	109.309	111.364	145.923	146.374	141.673	141.069	147.407	146.242	110.412
Take 08	146.732	148.665	146.437	147.905	140.322	141.726	148.491	147.037	109.775	110.820	145.099	146.628	142.710	140.305	148.475	148.239	109.431
Take 09	147.964	148.959	148.031	147.878	140.322	140.508	147.664	147.697	110.198	111.876	149.010	147.571	141.816	138.963	148.468	148.759	109.557
Take 10	147.137	147.352	145.959	146.238	139.170	140.225	146.723	147.502	110.017	110.718	146.153	146.191	139.045	138.508	147.925	147.354	110.185
Take 11	147.492	147.921	146.703	146.650	138.158	138.553	147.209	148.489	110.259	111.280	147.667	146.567	140.664	139.244	147.628	148.890	110.448
Take 12	143.906	147.451	145.965	145.895	139.680	141.391	146.103	147.133	109.859	109.887	145.957	146.304	140.677	139.846	149.191	148.064	109.868
Take 13	145.184	148.075	146.956	147.755	138.984	142.348	146.857	147.957	109.859	109.899	144.639	145.896	139.423	139.337	147.599	147.929	109.681
Take 14	145.764	146.743	145.456	144.319	136.770	137.581	145.708	147.356	109.061	109.660	145.351	145.473	139.000	136.730	147.654	144.824	109.675
Take 15	145.146	146.512	145.698	146.988	137.310	138.110	145.888	146.760	108.787	109.282	147.073	144.914	138.990	139.330	146.750	146.320	109.311
Take 16	146.291	147.641	146.325	146.199	140.388	142.544	147.350	147.503	109.891	112.232	145.694	145.473	139.971	138.075	147.768	146.076	109.035
Take 17	146.792	146.862	147.044	146.362	140.240	140.507	146.726	145.864	108.673	110.765	147.108	146.567	140.263	138.827	147.670	146.207	108.959
Take 18	145.841	147.139	145.600	145.783	138.172	137.746	146.174	145.795	109.664	110.149	145.655	145.850	141.048	136.869	147.909	146.768	109.073
Take 19	146.105	146.471	145.740	146.401	138.945	140.242	145.234	146.801	109.067	110.429	146.273	146.329	139.486	139.269	146.675	146.260	108.593
Take 20	146.131	148.056	148.408	146.083	140.271	141.475	146.855	146.711	108.765	110.213	146.965	144.681	141.975	140.829	147.669	146.185	108.888
Take 21	147.102	148.644	147.354	147.547	140.287	140.824	144.356	146.456	109.514	109.884	146.390	145.044	140.823	139.973	147.988	144.859	108.713
Bass 3 AVERAGE	**146.279**	**147.492**	**146.525**	**146.428**	**139.039**	**140.077**	**146.605**	**147.186**	**109.634**	**110.672**	**146.429**	**145.913**	**140.585**	**139.274**	**147.949**	**147.047**	**109.521**
Cents RF+3rds	-8.859	5.440	-5.951	-7.102	3.265	16.138	-5.000	1.846	-8.087	8.217	-7.083	-13.194	22.406	6.189	10.792	0.208	-9.876
Cents RF-3rds	-4.483	9.816	-1.575	-2.726	7.641	20.514	-0.624	6.222	-3.711	12.593	-2.707	-8.818	26.782	10.565	15.168	4.584	-5.500
Just Int I	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995
Just Int II	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995
Pythagorean	0.000	0.000	0.000	0.000	9.775	9.775	0.000	0.000	1.955	1.955	0.000	0.000	9.775	9.775	0.000	0.000	1.955
Meantone	0.000	0.000	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421	-3.421	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421
Take 01	147.185	151.693	150.408	147.564	140.461	141.479	151.650	151.793	110.861	110.033	151.786	147.689	142.725	140.292	150.656	152.287	109.720
Take 02																	
Take 03	145.258	145.856	146.151	145.265	138.401	139.460	147.007	147.378	109.193	108.287	149.896	147.080	140.983	139.564	149.354	147.706	108.867
Take 04	145.361	147.481	146.664	147.018	140.118	140.093	149.015	149.454	110.346	108.200	147.327	147.987	139.491	138.679	149.077	147.390	110.194
Take 05																	
Take 06	145.328	146.388	144.985	144.255	138.040	138.179	147.168	147.846	109.255	110.429	147.987	145.730	140.738	138.659	148.415	148.597	109.707
Take 07	147.346	146.755	146.375	148.213	140.924	142.178	148.063	149.426	110.219	109.985	150.472	147.727	142.766	142.135	148.319	147.203	110.443
Take 08	147.148	148.794	149.286	146.064	140.620	141.647	148.580	147.483	110.123	109.234	147.777	148.415	141.216	139.985	148.960	147.707	109.924
Take 09	146.431	147.352	146.654	148.067	141.528	142.787	149.416	149.961	109.487	110.429	148.949	148.105	140.613	141.663	148.750	149.525	110.000
Take 10	147.909	147.921	145.578	146.407	141.087	140.451	147.210	147.716	109.867	109.328	148.084	145.727	139.746	138.808	148.875	150.321	109.016

Take 11	148.363	146.503	144.859	144.464	138.859	141.575	146.109	148.389	110.469	109.559	148.314	146.382	141.617	138.868	148.929	148.859	109.809		
Take 12	146.839	146.627	146.828	144.790	139.295	139.330	147.249	151.051	109.684	109.692	148.534	146.167	140.552	139.134	149.595	150.035	108.981		
Take 13	149.455	149.547	147.996	148.329	140.075	140.418	148.585	150.049	109.805	110.129	148.577	147.116	142.077	140.000	148.749	150.959	110.054		
Take 14	145.015	144.824	144.296	145.023	138.155	138.950	146.205	148.438	110.405	111.058	148.530	146.138	140.812	139.022	149.194	148.382	109.540		
Take 15	146.002	148.596	147.203	146.996	140.881	140.576	146.759	148.726	109.478	110.273	148.071	147.077	141.889	142.774	148.162	146.800	109.699		
Take 16	146.794	147.987	148.583	147.915	141.226	141.316	148.796	147.996	109.995	108.538	148.755	146.583	140.702	139.317	149.009	148.142	109.629		
Take 17	146.404	148.194	147.648	146.984	141.249	141.305	146.746	147.204	109.654	109.505	147.007	145.537	138.553	141.256	148.905	146.432	109.917		
Take 18	145.000	144.949	144.885	146.027	137.390	140.482	146.420	150.957	110.002	108.771	146.982	146.392	139.294	137.327	147.480	148.269	109.156		
Take 19	149.318	145.661	145.053	144.636	140.136	141.330	147.587	149.086	109.704	108.289	150.587	146.653	143.753	140.123	147.471	148.291	109.202		
Take 20	145.558	149.012	147.492	147.141	141.155	140.579	147.649	148.677	108.468	109.443	146.842	146.578	139.094	140.156	149.549	148.107	109.702		
Take 21	146.788	147.218	147.489	147.249	140.072	139.620	148.475	147.654	109.543	107.976	148.281	146.353	140.578	138.608	148.422	149.219	109.097		
Bass 4 AVERAGE	**146.711**	**147.440**	**146.760**	**146.442**	**139.983**	**140.619**	**147.826**	**148.910**	**109.819**	**109.429**	**148.566**	**146.812**	**140.905**	**139.809**	**148.835**	**148.644**	**109.613**		
Cents RF+3rds	-3.759	4.826	-3.181	-6.926	14.970	22.817	9.350	21.998	-5.176	-11.327	18.001	-2.560	26.343	12.819	21.134	18.903	-8.418		
Cents RF-3rds	0.617	9.202	1.195	-2.550	19.346	27.193	13.726	26.374	-0.800	-6.951	22.377	1.816	30.719	17.195	25.510	23.279	-4.042		
Just Int I	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995		
Just Int II	0.000	0.000	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995	1.995	0.000	0.000	-11.731	-11.731	0.000	0.000	1.995		
Pythagorean	0.000	0.000	0.000	0.000	9.775	9.775	0.000	0.000	1.955	1.955	0.000	0.000	9.775	9.775	0.000	0.000	1.955		
Meantone	0.000	0.000	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421	-3.421	0.000	0.000	-17.108	-17.108	0.000	0.000	-3.421		

Second Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
Take 01	222.397	222.682	220.829	250.063	251.748	165.055	161.539	171.337	182.893	187.713	123.648	135.888	146.209	147.327	165.137	166.912	110.211			
Take 02																				
Take 03	219.930	219.977	220.761	247.812	252.338	164.448	164.450	170.099	183.855	187.873	122.986	137.540	144.432	143.337	164.157	165.427	109.556			
Take 04	221.933	220.487	216.320	245.869	249.680	165.799	164.137	170.618	182.591	189.412	123.607	138.146	147.463	146.042	164.632	164.743	110.940			
Take 05																				
Take 06	220.443	219.185	218.846	243.377	246.125	165.931	163.956	175.110	182.599	185.874	123.695	136.727	146.778	145.102	162.163	164.808	108.786			
Take 07	221.468	220.916	220.006	248.409	248.998	166.069	163.031	172.708	183.463	185.550	122.452	136.876	144.806	145.283	165.138	166.074	110.345			
Take 08	221.177	220.639	221.890	246.646	249.497	162.949	163.085	171.960	184.128	184.890	121.876	139.281	147.250	146.591	163.947	166.117	107.835			
Take 09	222.775	221.311	216.611	249.018	251.684	168.786	164.632	173.746	181.426	187.048	124.921	140.250	144.221	146.411	164.845	166.958	111.145			
Take 10	218.475	222.213	222.076	248.939	247.236	162.905	163.303	170.816	182.434	187.221	125.317	137.930	145.644	147.412	164.114	166.323	109.517			
Take 11	221.933	221.573	221.697	248.926	249.137	166.617	162.617	174.319	184.432	187.216	122.841	138.736	146.663	146.664	163.886	166.203	111.569			
Take 12	222.250	222.849	222.127	249.132	252.297	166.052	163.859	171.806	184.488	186.553	124.403	136.996	144.795	146.633	164.940	166.302	110.231			
Take 13	221.074	221.593	221.053	248.471	252.692	167.037	161.775	172.735	183.360	187.386	123.227	139.983	148.346	147.277	164.601	165.309	111.384			
Take 14	221.755	222.717	218.414	245.139	249.027	166.061	164.307	172.233	184.809	185.899	122.864	136.189	143.430	146.943	163.312	165.660	109.533			
Take 15	219.585	221.669	219.139	249.377	247.158	166.966	162.982	170.793	184.167	184.776	124.917	137.269	146.618	146.959	163.584	165.467	111.426			
Take 16	220.621	218.500	219.316	247.485	250.740	162.853	159.946	171.500	184.888	184.141	123.499	140.909	145.092	147.946	163.964	166.133	108.428			
Take 17	221.101	217.941	221.146	245.789	248.129	162.142	163.523	171.327	184.292	185.485	121.265	136.707	144.883	145.833	163.725	165.080	111.104			
Take 18	218.386	217.712	216.784	248.071	249.386	0.000	167.753	172.949	183.526	185.448	125.357	134.770	145.830	147.484	163.275	163.719	109.348			
Take 19	218.945	219.810	217.028	246.488	249.520	163.087	161.794	171.833	182.447	186.906	120.672	138.124	147.225	145.411	163.547	163.702	110.757			
Take 20	221.511	222.577	220.909	247.312	251.292	160.857	160.651	169.058	180.290	185.607	122.039	135.798	147.673	147.587	163.640	166.940	109.689			
Take 21	219.918	220.419	220.961	249.636	253.268	166.301	164.552	174.396	183.723	183.265	125.493	138.614	146.800	148.435	164.504	161.023	108.252			
Bass 1 AVERAGE	**220.825**	**220.777**	**219.785**	**247.682**	**249.997**	**164.995**	**163.257**	**172.071**	**183.358**	**186.224**	**123.425**	**137.723**	**146.008**	**146.562**	**164.059**	**165.416**	**110.003**			
Cents RF+3rds	5.577	5.202	-2.598	4.279	20.387	1.000	-17.330	-26.307	-16.309	10.542	-1.544	-11.788	-10.647	-4.095	-8.856	5.408	-0.857			
Cents RF-3rds	7.279	6.903	-0.897	5.980	22.089	2.702	-15.629	-24.605	-14.607	12.243	0.157	-10.087	-8.945	-2.394	-7.155	7.109	0.844			
Just Int I	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000			
Just Int II	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000			
Pythagorean	0.000	0.000	0.000	3.910	3.910	1.955	1.955	15.640	5.865	5.865	3.910	7.820	-1.955	-1.955	1.955	1.955	0.000			
Meantone	0.000	0.000	0.000	-6.843	-6.843	-3.421	-3.421	-27.373	-10.264	-10.264	-6.843	-13.686	3.422	3.422	-3.421	-3.421	0.000			
Take 01	218.300	217.733	222.216	245.232	246.147	163.869	165.869	175.209	185.321	183.429	123.278	139.029	146.162	146.565	165.756	166.129	110.519			
Take 02																				
Take 03	219.041	219.230	220.018	246.316	248.666	165.670	162.856	173.078	180.920	184.705	121.603	137.013	147.640	147.064	163.695	166.070	109.786			
Take 04	218.740	220.932	221.289	244.357	245.944	162.457	164.198	173.163	181.799	182.801	120.934	138.756	146.371	147.638	164.259	164.409	109.173			
Take 05																				
Take 06	218.922	218.257	222.329	246.010	247.192	166.485	166.172	171.827	182.473	183.216	121.276	137.444	144.779	146.608	164.199	164.887	109.795			

Take 07	219.064	220.383	220.982	246.550	246.173	161.953	163.753	174.201	182.208	183.675	124.350	139.598	147.673	145.899	163.916	165.351	109.788
Take 08	219.022	221.016	220.597	249.978	247.940	164.618	165.957	173.546	182.069	183.863	123.921	139.615	146.188	146.732	164.988	164.405	109.758
Take 09	220.893	219.584	219.568	242.377	246.378	160.601	164.057	172.027	181.571	184.709	122.244	137.910	146.962	147.814	165.277	165.476	109.630
Take 10	218.621	218.884	219.635	242.833	246.660	164.406	165.818	172.711	182.715	182.832	122.542	139.229	146.191	146.217	163.966	164.790	110.660
Take 11	221.356	221.464	221.898	245.033	245.577	165.714	166.440	175.192	183.954	183.893	121.281	140.333	147.210	147.936	164.965	166.223	110.195
Take 12	218.139	219.523	221.350	245.834	244.385	164.613	165.449	173.622	184.370	185.871	124.241	138.619	146.406	146.970	164.226	164.888	109.853
Take 13	219.581	219.884	220.111	246.369	247.375	164.898	165.066	172.497	181.684	184.242	121.256	138.117	146.005	147.153	164.288	167.017	108.791
Take 14	217.341	218.678	219.285	243.871	247.759	163.771	162.849	170.730	181.057	184.374	122.263	138.082	145.837	146.741	163.018	164.436	109.143
Take 15	217.789	218.764	219.086	244.951	247.076	165.133	165.059	171.411	181.244	185.258	121.058	138.515	145.800	146.488	163.804	163.594	109.424
Take 16	218.566	216.688	218.722	246.407	245.599	165.699	165.722	173.622	181.237	182.612	121.361	137.926	147.804	147.687	163.479	165.253	110.125
Take 17	217.426	218.131	217.466	246.133	247.472	166.716	164.892	173.500	181.437	182.261	122.098	137.152	145.841	145.985	163.062	164.640	109.717
Take 18	216.963	219.088	218.317	245.504	245.685	161.590	162.435	171.901	184.835	183.309	122.488	139.972	147.007	146.239	163.895	164.853	108.282
Take 19	216.348	218.382	219.796	243.019	246.265	164.552	164.801	170.877	180.933	181.261	123.360	137.741	145.553	146.438	162.756	164.785	109.100
Take 20	219.240	217.447	218.364	245.291	245.028	164.525	161.886	172.923	180.864	182.710	120.429	139.246	145.301	146.026	164.141	163.284	109.646
Take 21	217.535	215.516	218.364	247.432	248.095	160.968	163.579	171.595	181.872	183.168	123.932	138.144	145.712	147.459	164.333	165.222	109.735
Bass 2 AVERAGE	**218.573**	**218.926**	**219.968**	**245.447**	**246.601**	**164.118**	**164.572**	**172.823**	**182.240**	**183.589**	**122.311**	**138.549**	**146.339**	**146.824**	**164.106**	**165.037**	**109.638**
Cents RF+3rds	-12.170	-9.380	-1.157	-11.413	-3.296	-8.232	-3.451	-18.756	-26.900	-14.134	-17.240	-1.427	-6.730	-1.000	-8.350	1.443	-6.614
Cents RF-3rds	-10.469	-7.679	0.545	-9.712	-1.594	-6.531	-1.750	-17.055	-25.199	-12.433	-15.538	0.274	-5.029	0.701	-6.649	3.144	-4.913
Just Int I	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000
Just Int II	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000
Pythagorean	0.000	0.000	0.000	3.910	3.910	1.955	1.955	15.640	5.865	5.865	3.910	7.820	-1.955	-1.955	1.955	1.955	0.000
Meantone	0.000	0.000	0.000	-6.843	-6.843	-3.421	-3.421	-27.373	-10.264	-10.264	-6.843	-13.686	3.422	3.422	-3.421	-3.421	0.000
Take 01	221.997	220.411	222.022	246.630	251.755	163.325	167.063	172.534	184.232	185.262	122.637	141.705	149.031	148.704	166.338	166.913	110.455
Take 02																	
Take 03	219.895	220.515	219.268	243.152	248.699	162.866	165.823	172.777	183.790	183.810	123.520	138.058	146.482	147.552	165.812	165.345	109.243
Take 04	220.929	217.680	223.265	173.251	246.904	162.514	166.214	173.673	182.483	185.535	123.127	138.733	147.821	146.905	165.053	165.536	109.733
Take 05																	
Take 06	219.832	221.477	217.482	246.310	247.839	164.137	164.320	172.197	183.659	184.031	121.547	137.919	143.915	145.433	164.315	164.730	110.215
Take 07	221.466	220.715	219.697	245.787	246.139	164.055	165.943	173.111	185.318	184.314	122.995	141.138	148.679	147.520	164.095	164.205	110.071
Take 08	219.495	219.954	220.964	245.050	249.237	156.383	164.806	172.133	184.023	184.708	123.145	139.546	148.152	146.854	164.888	166.054	109.956
Take 09	221.394	222.406	221.432	242.886	246.161	165.967	165.466	172.609	184.117	185.694	122.290	139.632	145.781	145.634	165.188	166.524	109.548
Take 10	219.274	221.247	219.599	246.041	249.389	163.803	164.939	172.919	181.233	184.677	121.290	139.297	148.169	146.478	164.111	165.442	109.713
Take 11	221.861	220.985	221.420	246.114	249.496	168.207	168.434	176.384	184.379	186.369	123.237	142.346	148.635	148.187	166.046	166.475	110.410
Take 12	204.840	219.489	218.028	242.325	247.185	167.941	167.819	176.400	184.398	185.321	122.041	139.906	145.339	147.078	166.063	166.415	109.420
Take 13	221.603	221.166	218.494	246.699	247.231	163.410	164.263	171.167	181.773	185.607	123.231	139.382	149.646	149.807	165.779	165.128	110.728
Take 14	218.413	217.790	218.711	243.405	247.259	164.049	164.453	173.120	183.867	184.465	122.317	138.165	145.143	146.053	163.911	165.714	109.068
Take 15	219.492	219.076	220.336	241.933	249.060	162.843	165.831	171.699	181.771	184.917	122.881	137.856	146.170	146.020	164.030	164.019	109.319
Take 16	219.458	219.909	221.928	238.708	246.907	163.909	164.022	173.444	181.861	183.793	122.551	139.048	146.103	147.396	164.657	164.792	110.122
Take 17	218.825	217.036	217.939	241.824	245.664	160.417	164.500	173.486	183.286	184.215	119.067	139.705	145.241	146.208	164.419	166.321	110.025
Take 18	218.048	218.334	218.160	241.295	244.942	165.524	164.619	172.872	180.449	183.432	124.800	139.521	147.219	148.051	164.852	164.995	109.559
Take 19	217.724	216.360	217.401	245.476	249.508	166.265	163.941	171.741	179.593	183.168	121.829	137.732	145.655	144.687	164.915	165.100	109.794
Take 20	220.518	218.490	222.328	244.436	243.842	163.344	166.716	175.059	184.819	184.480	128.427	141.959	148.668	150.443	166.697	167.362	109.460
Take 21	218.566	219.828	218.645	243.316	249.550	158.147	165.968	175.652	183.283	184.964	124.279	140.837	147.564	147.396	165.531	165.466	109.231
Bass 3 AVERAGE	**219.933**	**219.625**	**219.848**	**243.966**	**247.725**	**163.532**	**165.534**	**173.315**	**183.070**	**184.672**	**122.906**	**139.605**	**147.022**	**147.179**	**165.089**	**165.607**	**109.793**
Cents RF+3rds	-1.434	-3.859	-2.098	-21.893	4.576	-14.423	6.641	-13.837	-19.033	-3.954	-8.844	11.706	1.328	3.181	1.989	7.409	-4.163
Cents RF-3rds	0.267	-2.158	-0.397	-20.192	6.277	-12.721	8.342	-12.136	-17.332	-2.253	-7.143	13.408	3.029	4.882	3.690	9.110	-2.462
Just Int I	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000
Just Int II	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000
Pythagorean	0.000	0.000	0.000	3.910	3.910	1.955	1.955	15.640	5.865	5.865	3.910	7.820	-1.955	-1.955	1.955	1.955	0.000
Meantone	0.000	0.000	0.000	-6.843	-6.843	-3.421	-3.421	-27.373	-10.264	-10.264	-6.843	-13.686	3.422	3.422	-3.421	-3.421	0.000
Take 01	223.293	221.045	223.800	252.586	257.401	168.321	165.350	176.215	188.001	189.588	121.387	140.595	145.977	151.101	166.864	168.337	110.622
Take 02																	
Take 03	220.504	220.112	222.540	252.475	254.699	166.565	163.535	174.431	185.274	187.322	122.531	144.974	151.710	147.245	167.449	165.823	110.092
Take 04	220.891	220.797	222.546	249.495	253.143	164.410	162.694	175.559	184.508	187.469	124.011	140.811	146.423	144.769	165.473	166.967	109.778

Take 05																							
Take 06	220.455	218.268	218.993	254.381	254.860	170.270	165.725	179.020	186.018	185.133	122.547	137.924	145.291	146.072	164.559	165.443	109.567						
Take 07	222.149	220.089	220.864	249.677	252.484	167.553	164.783	176.014	182.964	184.715	124.918	141.801	148.448	146.642	164.269	165.334	109.376						
Take 08	221.359	219.938	222.650	252.292	253.827	167.065	164.609	177.140	185.251	185.273	122.525	142.168	150.388	147.186	164.874	165.775	110.062						
Take 09	210.138	222.176	221.072	249.002	253.730	167.671	160.784	174.292	186.510	189.604	121.897	141.862	146.173	145.475	165.714	164.574	109.060						
Take 10	223.019	225.282	222.851	251.824	252.538	167.029	164.202	173.243	185.090	186.281	123.885	139.541	148.007	146.640	165.291	165.267	109.183						
Take 11	221.885	223.072	224.331	251.267	256.591	168.451	166.863	176.725	184.718	186.975	125.578	142.342	149.938	146.973	167.152	168.423	109.992						
Take 12	221.476	218.926	224.003	252.787	256.134	167.801	162.964	176.912	185.690	185.746	122.401	139.899	145.831	147.241	166.365	166.367	109.575						
Take 13	221.988	219.341	220.107	249.760	252.419	165.704	162.470	175.655	186.434	187.124	123.264	140.905	146.981	147.429	166.417	165.301	109.466						
Take 14	220.724	219.074	221.399	254.582	250.776	166.110	163.522	171.350	183.722	184.661	121.629	142.338	147.516	146.323	164.050	166.764	109.607						
Take 15	220.579	220.806	222.798	251.920	253.380	165.356	166.102	175.083	185.761	185.451	123.001	143.207	148.726	147.218	165.348	165.154	109.926						
Take 16	220.892	220.220	221.699	250.845	251.588	165.009	162.828	174.690	183.848	184.638	122.034	138.120	147.133	146.547	164.876	164.378	109.893						
Take 17	219.708	220.386	220.733	250.973	250.648	166.097	163.668	177.011	186.864	186.085	124.569	138.470	146.303	145.006	164.344	164.381	108.999						
Take 18	220.149	218.515	219.490	251.322	249.941	163.911	162.519	172.724	181.727	184.026	122.327	136.422	145.877	145.616	165.945	164.721	109.232						
Take 19	220.546	219.003	220.492	250.384	250.718	161.623	161.583	173.395	183.053	185.567	124.177	143.221	146.481	146.174	165.119	164.994	109.614						
Take 20	221.414	222.532	220.916	250.882	249.614	165.286	162.820	174.633	183.249	184.276	125.587	140.644	147.927	146.887	166.934	165.774	109.553						
Take 21	221.706	219.287	218.878	249.954	252.323	165.181	163.506	174.546	183.969	186.628	120.798	140.905	149.112	147.190	165.552	165.367	108.805						
Bass 4 AVERAGE	**220.678**	**220.467**	**221.588**	**251.390**	**252.990**	**166.064**	**163.712**	**175.191**	**184.876**	**186.135**	**123.109**	**140.621**	**147.592**	**146.723**	**165.610**	**165.744**	**109.600**						
Cents RF+3rds	4.420	2.765	11.543	30.003	40.990	12.174	-12.517	4.810	-2.036	9.708	-5.989	24.263	8.024	-2.196	7.443	8.843	-7.209						
Cents RF-3rds	6.122	4.467	13.245	31.705	42.691	13.875	-10.816	6.511	-0.334	11.409	-4.287	25.964	9.726	-0.494	9.144	10.545	-5.508						
Just Int I	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000						
Just Int II	0.000	0.000	0.000	3.910	3.910	1.995	1.995	-27.373	-15.641	-15.641	3.910	-13.686	-1.955	-1.955	1.995	1.995	0.000						
Pythagorean	0.000	0.000	0.000	3.910	3.910	1.955	1.955	15.640	5.865	5.865	3.910	7.820	-1.955	-1.955	1.955	1.955	0.000						
Meantone	0.000	0.000	0.000	-6.843	-6.843	-3.421	-3.421	-27.373	-10.264	-10.264	-6.843	-13.686	3.422	3.422	-3.421	-3.421	0.000						
	Third Phrase																						
	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20	Note 21	Note 22	Note 23
Take 01	223.648	225.793	219.728	195.876	199.324	127.540	128.632	128.592	173.081	177.838	175.494	176.262	162.142	145.582	137.620	113.068	118.789	112.124	104.418	107.873			
Take 02																							
Take 03	221.656	223.187	221.301	197.324	197.859	125.350	128.648	128.706	175.240	178.046	177.742	173.108	165.071	142.748	136.554	113.831	117.334	109.918	102.596	107.616			
Take 04	222.054	224.952	222.428	193.020	198.975	128.561	128.879	129.372	171.837	179.649	177.016	173.912	164.259	145.827	137.518	113.500	118.315	107.500	101.162	107.846			
Take 05																							
Take 06	220.758	218.565	218.629	195.771	195.369	129.672	129.646	130.809	173.542	175.480	175.043	173.118	164.853	145.050	139.541	109.851	115.545	106.365	104.922	108.835			
Take 07	218.340	219.286	217.989	196.220	197.113	129.550	129.111	130.736	172.622	176.725	175.510	174.909	166.216	143.358	136.198	110.711	117.768	109.552	102.979	108.862			
Take 08	222.005	222.299	219.702	191.563	196.889	131.218	129.406	128.017	173.485	178.182	176.041	172.236	162.811	143.922	135.920	111.061	118.149	108.482	105.374	106.344			
Take 09	220.267	223.804	221.808	196.772	198.895	129.938	126.867	128.987	170.882	177.254	176.146	172.838	167.871	146.254	137.529	112.119	116.758	111.705	102.701	108.983			
Take 10	221.784	223.226	219.458	196.311	199.536	128.786	129.739	132.018	175.774	177.757	174.929	175.433	164.692	150.616	140.373	110.998	116.300	111.815	106.201	109.762			
Take 11	222.444	222.302	219.993	195.989	197.102	129.974	131.704	131.214	174.494	178.872	177.090	173.647	166.329	140.305	137.526	0.000	114.818	106.131	104.756	106.935			
Take 12	221.933	222.107	222.216	196.667	199.059	127.939	129.057	129.292	173.459	177.091	175.837	173.157	163.752	145.022	138.433	111.636	116.782	107.519	104.502	108.922			
Take 13	220.633	223.356	221.698	194.755	196.980	129.861	127.701	128.768	171.422	176.146	173.817	171.271	164.776	144.075	137.193	107.299	117.310	108.894	106.885	110.193			
Take 14	222.329	219.902	222.294	196.166	197.103	128.695	129.887	131.077	171.262	175.572	173.329	173.641	164.246	143.715	137.783	112.290	114.662	109.897	103.402	109.894			
Take 15	221.370	221.085	217.298	194.457	197.213	128.795	125.980	130.047	173.323	175.210	177.186	176.427	167.383	146.493	139.860	109.917	116.426	108.141	110.507	110.657			
Take 16	221.770	219.304	218.369	194.702	195.227	127.391	129.270	128.105	171.835	173.856	174.329	173.182	160.782	140.322	135.588	103.948	118.152	108.132	104.212	108.773			
Take 17	218.424	224.437	216.694	195.201	196.879	128.794	129.105	127.169	175.000	175.209	172.294	172.650	163.333	143.229	137.926	107.066	116.731	109.887	107.338	109.808			
Take 18	220.832	223.786	221.408	196.303	199.242	126.558	128.334	127.871	172.793	175.594	172.151	171.511	165.589	146.540	139.526	107.727	114.863	106.463	104.130	107.538			
Take 19	222.175	221.608	220.173	197.057	197.733	128.510	128.431	133.238	172.215	175.858	174.271	175.185	161.612	145.195	138.920	111.415	118.645	109.233	104.961	108.962			
Take 20	223.349	223.742	221.803	197.835	199.592	127.745	131.015	131.051	173.361	179.774	172.437	172.608	163.165	145.481	140.549	111.254	116.026	108.870	105.431	109.063			
Take 21	220.548	221.718	218.714	195.063	197.101	126.556	128.074	127.826	173.171	175.015	174.875	172.719	163.444	144.564	140.098	107.185	117.312	109.023	104.532	110.329			
Bass 1 AVERAGE	**221.385**	**222.340**	**220.090**	**195.634**	**197.747**	**128.496**	**128.920**	**129.626**	**173.095**	**176.796**	**175.028**	**173.569**	**164.333**	**144.647**	**138.140**	**110.444**	**116.878**	**108.929**	**104.304**	**108.800**			
Cents RF+3rds	4.140	11.589	-6.020	-9.939	8.657	-37.657	-31.955	-22.503	-21.856	14.775	-2.624	-17.117	-11.784	-32.683	-12.375	0.241	-1.724	-23.663	1.220	-25.719			
Cents RF-3rds	8.407	15.857	-1.753	-5.672	12.924	-33.390	-27.688	-18.236	-17.589	19.042	1.643	-12.850	-7.517	-28.416	-8.108	4.508	2.543	-19.396	5.487	-21.452			
Just Int I	0.000	0.000	0.000	-31.174	-31.174	7.820	7.820	7.820	-7.819	-7.819	-56.590	-56.590	-19.551	-19.551	-35.192	-21.506	-16.551	-21.506	-33.237	-21.506			
Just Int II	0.000	0.000	0.000	-31.174	-31.174	29.326	29.326	29.326	13.687	13.687	-35.084	-35.084	1.955	-1.955	-13.686	0.000	4.955	0.000	-11.731	0.000			
Pythagorean	0.000	0.000	0.000	-3.910	-3.910	-5.865	-5.865	-5.865	-7.820	-7.820	-7.820	-7.820	1.955	-1.955	7.820	0.000	-9.775	0.000	9.775	0.000			
Meantone	0.000	0.000	0.000	6.843	6.843	10.265	10.265	10.265	13.686	13.686	13.686	13.686	-3.421	3.422	-13.686	0.000	17.107	0.000	-17.108	0.000			

Take 01	222.003	224.438	222.656	195.401	196.414	132.247	131.830	130.575	175.912	175.705	175.182	173.274	166.232	148.772	140.023	113.059	116.127	112.875	105.318	109.987
Take 02																				
Take 03	221.114	220.523	220.108	194.164	195.730	129.896	129.378	130.867	171.595	174.551	174.440	173.812	163.551	146.413	140.191	110.228	115.971	111.044	104.938	110.470
Take 04	221.062	220.795	220.283	194.237	193.753	129.858	128.635	130.698	173.298	175.321	175.203	173.530	165.717	148.194	138.687	107.920	115.996	110.401	104.577	109.269
Take 05																				
Take 06	220.280	220.335	220.483	195.488	195.454	129.872	130.005	130.217	172.455	174.643	173.939	172.200	164.162	148.083	136.997	109.103	115.182	110.299	104.348	109.672
Take 07	221.391	218.363	220.096	193.304	195.700	129.439	129.938	131.210	171.820	174.772	174.598	174.849	164.066	146.352	138.736	109.252	115.716	110.192	103.695	109.348
Take 08	221.675	220.393	219.169	194.085	195.056	129.581	127.237	129.305	171.769	174.535	174.295	174.093	165.789	146.920	137.652	107.412	115.016	109.644	104.419	109.892
Take 09	222.185	220.339	220.232	194.385	198.450	130.638	129.482	130.089	175.957	174.316	173.933	171.392	165.415	147.381	140.836	107.426	115.336	108.157	104.354	108.516
Take 10	220.852	217.353	219.856	196.291	197.128	129.716	129.831	131.486	172.740	175.385	174.631	171.241	165.107	146.767	137.899	108.420	116.744	108.725	104.247	110.112
Take 11	221.064	223.871	221.129	195.356	194.827	130.658	130.157	130.773	177.369	174.381	173.458	172.092	164.383	148.567	141.494	108.373	116.740	109.294	105.279	108.916
Take 12	222.054	219.539	220.357	196.688	197.391	130.192	129.937	130.225	173.377	174.944	173.458	172.439	163.990	146.328	139.088	110.556	115.359	110.279	105.093	108.759
Take 13	221.567	220.769	221.443	193.086	193.491	129.373	130.069	130.371	174.217	174.619	174.726	173.272	166.572	147.357	138.358	107.210	115.959	109.040	103.740	108.589
Take 14	220.541	219.906	220.252	195.465	196.271	129.299	129.994	130.479	172.982	174.975	173.978	172.496	164.585	145.372	136.092	108.745	115.325	108.831	103.711	108.784
Take 15	219.593	217.719	217.882	193.399	195.209	129.628	129.195	129.957	173.528	174.544	173.141	171.039	164.387	145.447	138.941	107.386	115.414	109.124	104.543	108.909
Take 16	221.625	220.711	218.552	192.157	193.866	130.129	129.632	130.607	171.810	174.438	173.306	173.281	164.732	147.677	140.264	107.803	115.845	108.647	103.083	108.042
Take 17	220.162	219.533	218.464	192.860	193.035	128.573	129.944	129.922	172.150	174.071	173.409	170.841	163.306	147.245	138.746	109.846	115.545	108.011	103.400	108.916
Take 18	219.980	218.490	218.083	193.421	194.467	128.819	127.393	129.139	172.449	173.019	172.874	171.456	163.660	147.653	136.585	107.330	115.376	107.656	104.046	109.244
Take 19	220.062	219.895	217.807	190.846	194.764	130.472	129.250	129.841	172.669	173.897	173.132	171.553	163.142	145.297	138.836	106.429	114.350	108.876	104.259	108.766
Take 20	218.974	220.476	220.682	195.323	194.483	128.188	129.532	129.243	170.460	174.318	171.448	169.859	166.364	146.224	136.876	108.679	116.510	110.612	104.803	107.501
Take 21	220.755	219.874	219.870	193.270	194.558	129.488	130.421	130.152	174.057	176.067	173.394	173.311	164.784	148.321	141.657	112.462	116.488	112.005	106.197	110.104
Bass 2 AVERAGE	**220.892**	**220.175**	**219.863**	**194.170**	**195.266**	**129.793**	**129.571**	**130.271**	**173.190**	**174.658**	**173.818**	**172.423**	**164.734**	**147.072**	**138.840**	**108.823**	**115.737**	**109.669**	**104.424**	**109.147**
Cents RF+3rds	0.276	-5.350	-7.802	-22.948	-13.205	-20.276	-23.233	-13.908	-20.901	-6.292	-14.637	-28.592	-7.566	-3.902	-3.623	-25.347	-18.713	-11.943	3.208	-20.201
Cents RF-3rds	4.544	-1.083	-3.535	-18.681	-8.938	-16.009	-18.965	-9.641	-16.634	-2.024	-10.369	-24.324	-3.298	0.365	0.644	-21.080	-14.445	-7.676	7.475	-15.934
Just Int I	0.000	0.000	0.000	-31.174	-31.174	7.820	7.820	7.820	-7.819	-7.819	-56.590	-56.590	-19.551	-19.551	-35.192	-21.506	-16.551	-21.506	-33.237	-21.506
Just Int II	0.000	0.000	0.000	-31.174	-31.174	29.326	29.326	29.326	13.687	13.687	-35.084	-35.084	1.955	-1.955	-13.686	0.000	4.955	0.000	-11.731	0.000
Pythagorean	0.000	0.000	0.000	-3.910	-3.910	-5.865	-5.865	-5.865	-7.820	-7.820	-7.820	-7.820	1.955	-1.955	7.820	0.000	-9.775	0.000	9.775	0.000
Meantone	0.000	0.000	0.000	6.843	6.843	10.265	10.265	10.265	13.686	13.686	13.686	13.686	-3.421	3.422	-13.686	0.000	17.107	0.000	-17.108	0.000
Take 01	222.831	222.769	220.989	196.808	197.788	131.099	131.398	131.818	174.971	178.532	178.238	175.956	165.450	146.201	140.034	110.872	115.678	110.811	105.423	110.748
Take 02																				
Take 03	222.471	220.073	221.244	194.634	196.145	130.638	130.890	130.225	173.943	174.780	176.467	175.211	167.471	146.564	137.185	108.490	116.681	109.450	103.878	109.525
Take 04	221.815	220.086	217.750	194.520	193.619	129.924	130.788	129.618	173.327	177.393	177.061	174.541	165.862	146.909	141.556	108.596	115.094	110.713	103.833	109.868
Take 05																				
Take 06	221.550	220.716	217.630	193.376	196.651	130.247	129.910	130.702	172.913	176.549	174.975	172.831	164.156	146.313	139.089	108.647	115.609	109.858	104.949	109.730
Take 07	220.979	221.088	219.117	195.041	196.080	129.999	130.272	130.141	174.549	176.800	175.667	172.686	169.222	147.700	138.949	106.894	114.493	108.661	103.305	109.039
Take 08	220.697	221.762	216.997	196.253	195.080	130.167	130.070	129.638	174.570	175.732	174.639	174.358	165.828	147.590	139.483	108.643	114.744	109.180	105.708	109.846
Take 09	222.614	219.982	219.420	195.278	197.550	129.470	130.796	130.742	169.999	176.536	176.400	174.139	166.705	145.643	138.301	108.552	115.154	109.264	103.820	108.822
Take 10	221.716	222.667	220.928	194.442	194.918	130.551	130.123	129.964	175.740	176.319	173.672	171.429	163.941	146.748	140.099	110.277	116.217	110.762	105.214	110.485
Take 11	222.302	221.645	218.764	194.931	195.190	130.084	129.332	129.063	174.247	176.476	176.893	174.547	165.636	146.781	140.534	110.471	116.046	110.540	104.454	110.266
Take 12	224.805	221.243	219.266	196.137	194.915	130.062	128.300	131.605	175.844	176.667	175.428	173.659	165.144	146.080	139.569	109.000	115.910	108.310	103.410	109.192
Take 13	222.344	223.681	219.275	195.331	195.175	129.778	129.740	130.974	174.804	176.066	175.646	173.976	167.309	148.415	136.861	109.571	115.867	109.535	104.711	110.193
Take 14	220.797	222.217	220.510	195.211	196.605	128.911	130.402	128.710	173.916	175.473	174.906	173.062	165.610	146.155	139.308	108.272	114.601	109.529	103.700	109.555
Take 15	222.084	221.153	217.095	195.514	195.789	129.744	127.741	129.382	174.860	177.348	175.736	174.875	165.443	146.485	138.566	110.221	114.612	108.449	104.755	109.441
Take 16	220.710	217.895	218.591	192.810	194.430	128.886	127.076	128.942	172.044	176.063	173.995	172.643	165.699	145.880	138.598	108.490	114.111	108.347	103.586	108.598
Take 17	220.022	219.701	219.921	193.181	193.621	128.838	129.048	129.108	171.916	175.163	175.278	173.581	164.246	146.759	138.776	112.147	115.643	108.848	103.765	108.765
Take 18	220.211	221.405	215.516	195.157	196.627	127.944	129.310	128.508	171.176	176.011	175.233	172.734	164.464	143.457	138.174	106.344	115.309	108.822	104.046	108.434
Take 19	219.912	220.435	218.499	194.208	194.988	129.106	129.311	129.337	170.838	177.020	176.593	173.484	166.093	146.420	139.165	108.401	115.264	108.200	105.191	109.215
Take 20	222.346	221.984	217.636	194.283	193.432	130.873	130.390	132.904	174.010	174.709	176.363	175.369	168.590	150.023	142.518	110.149	115.083	107.937	103.025	107.378
Take 21	222.718	222.033	216.268	193.878	195.827	128.670	128.840	128.820	170.339	175.430	174.981	174.435	165.348	145.705	138.501	109.383	115.310	108.068	103.889	108.235
Bass 3 AVERAGE	**221.733**	**221.186**	**218.706**	**194.789**	**195.496**	**129.736**	**129.670**	**130.010**	**173.369**	**176.267**	**175.693**	**173.869**	**165.906**	**146.622**	**139.224**	**109.127**	**115.338**	**109.225**	**104.245**	**109.334**
Cents RF+3rds	6.856	2.582	-16.938	-17.434	-11.160	-21.032	-21.912	-17.377	-19.118	9.580	3.940	-14.127	4.710	-9.203	1.165	-20.514	-24.685	-18.959	0.248	-17.247
Cents RF-3rds	11.123	6.850	-12.671	-13.167	-6.893	-16.765	-17.644	-13.110	-14.851	13.847	8.207	-9.859	8.977	-4.936	5.432	-16.246	-20.418	-14.692	4.516	-12.980
Just Int I	0.000	0.000	0.000	-31.174	-31.174	7.820	7.820	7.820	-7.819	-7.819	-56.590	-56.590	-19.551	-19.551	-35.192	-21.506	-16.551	-21.506	-33.237	-21.506
Just Int II	0.000	0.000	0.000	-31.174	-31.174	29.326	29.326	29.326	13.687	13.687	-35.084	-35.084	1.955	-1.955	-13.686	0.000	4.955	0.000	-11.731	0.000

Pythagorean	0.000	0.000	0.000	-3.910	-3.910	-5.865	-5.865	-5.865	-7.820	-7.820	-7.820	-7.820	1.955	-1.955	7.820	0.000	-9.775	0.000	9.775	0.000
Meantone	0.000	0.000	0.000	6.843	6.843	10.265	10.265	10.265	13.686	13.686	13.686	13.686	-3.421	3.422	-13.686	0.000	17.107	0.000	-17.108	0.000
Take 01	227.127	224.646	223.020	200.719	198.778	130.259	131.842	130.943	179.070	182.501	177.432	177.705	165.231	147.269	138.875	108.347	117.039	109.715	106.947	110.920
Take 02																				
Take 03	223.157	225.847	222.631	195.746	195.932	129.162	132.077	129.965	177.094	179.488	176.187	175.286	164.559	147.009	138.929	107.195	116.340	109.528	104.270	110.808
Take 04	224.275	222.002	220.685	195.068	194.407	129.285	130.465	130.371	175.945	179.245	174.962	175.050	164.412	147.296	138.310	105.896	114.866	109.365	104.068	110.750
Take 05																				
Take 06	222.689	220.222	219.918	193.954	196.356	129.864	130.559	131.282	175.799	179.031	175.036	173.353	164.864	148.753	137.022	109.143	116.610	110.107	103.707	110.423
Take 07	223.039	221.737	219.465	197.943	199.902	130.301	131.523	130.893	175.596	179.801	176.770	176.195	165.149	147.536	139.689	107.411	117.093	108.720	103.778	110.522
Take 08	223.090	221.869	220.552	195.416	195.310	129.124	130.170	130.082	174.449	178.617	175.265	174.230	164.690	145.130	138.984	107.815	117.355	109.690	105.086	109.843
Take 09	223.284	221.242	219.456	195.687	196.867	128.649	129.390	130.130	174.737	177.432	178.429	175.182	165.255	146.378	139.879	108.654	116.030	107.251	103.984	109.383
Take 10	223.849	222.151	225.401	196.835	197.012	129.712	131.856	129.765	174.249	180.738	177.215	175.835	167.343	148.083	141.120	108.278	116.000	109.850	104.861	110.569
Take 11	225.331	222.052	221.057	196.029	196.212	129.823	130.734	129.552	173.981	178.709	176.886	174.026	164.767	146.968	140.496	108.056	115.008	109.397	104.914	110.451
Take 12	224.367	222.860	221.270	194.809	196.866	128.516	131.243	129.024	174.011	178.718	175.561	172.566	164.822	146.026	138.633	108.746	116.871	107.337	103.170	110.884
Take 13	222.789	223.561	222.035	196.769	197.378	130.399	130.714	131.148	173.410	180.253	176.661	175.424	166.228	147.889	139.566	106.627	116.654	110.649	104.480	110.745
Take 14	222.976	219.898	219.188	195.688	196.991	129.874	129.836	129.538	175.055	177.265	174.830	172.533	165.636	147.624	140.827	109.006	115.911	109.549	103.758	110.056
Take 15	222.158	220.536	221.739	194.156	197.607	130.143	130.867	131.403	173.508	178.755	175.084	174.182	165.328	148.232	140.516	107.572	116.159	108.702	104.585	108.693
Take 16	222.612	220.916	220.732	195.649	195.673	130.045	130.623	129.504	172.564	178.452	175.688	174.989	165.168	145.449	138.187	106.273	115.788	108.547	103.705	109.060
Take 17	223.237	221.465	218.388	195.710	195.971	130.153	130.411	130.447	172.532	178.463	175.175	174.693	165.847	147.008	138.622	109.260	116.306	109.294	105.092	109.904
Take 18	224.841	224.251	221.309	194.239	198.688	129.382	129.856	128.673	176.935	180.689	175.176	171.674	164.282	145.180	138.232	107.396	116.077	109.257	102.774	110.299
Take 19	223.488	220.198	219.273	196.945	196.910	128.075	131.250	128.942	172.915	177.753	178.387	173.451	163.538	145.530	142.690	106.981	114.877	108.750	103.472	109.126
Take 20	222.136	223.885	219.494	195.035	196.229	131.165	132.548	131.806	175.162	178.824	175.847	173.694	167.569	147.380	138.479	105.689	115.750	107.645	101.800	110.239
Take 21	220.860	221.410	218.806	195.919	196.191	130.053	131.457	129.950	172.996	178.182	175.323	173.622	163.426	146.873	138.154	109.112	116.453	108.858	101.853	109.852
Bass 4 AVERAGE	**223.437**	**222.145**	**220.759**	**195.911**	**196.804**	**129.683**	**130.917**	**130.180**	**174.737**	**179.101**	**176.101**	**174.405**	**165.164**	**146.927**	**139.327**	**107.761**	**116.168**	**109.064**	**104.016**	**110.133**
Cents RF+3rds	20.113	10.069	-0.764	-7.488	0.383	-21.738	-5.348	-15.122	-5.505	37.196	7.951	-8.802	-3.053	-5.610	2.437	-42.328	-12.279	-21.525	-3.563	-4.633
Cents RF-3rds	24.380	14.336	3.503	-3.221	4.650	-17.470	-1.081	-10.854	-1.238	41.463	12.218	-4.535	1.215	-1.343	6.704	-38.061	-8.012	-17.257	0.704	-0.366
Just Int I	0.000	0.000	0.000	-31.174	-31.174	7.820	7.820	7.820	-7.819	-7.819	-56.590	-56.590	-19.551	-19.551	-35.192	-21.506	-16.551	-21.506	-33.237	-21.506
Just Int II	0.000	0.000	0.000	-31.174	-31.174	29.326	29.326	29.326	13.687	13.687	-35.084	-35.084	1.955	-1.955	-13.686	0.000	4.955	0.000	-11.731	0.000
Pythagorean	0.000	0.000	0.000	-3.910	-3.910	-5.865	-5.865	-5.865	-7.820	-7.820	-7.820	-7.820	1.955	-1.955	7.820	0.000	-9.775	0.000	9.775	0.000
Meantone	0.000	0.000	0.000	6.843	6.843	10.265	10.265	10.265	13.686	13.686	13.686	13.686	-3.421	3.422	-13.686	0.000	17.107	0.000	-17.108	0.000

Fourth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16	Note 17	Note 18	Note 19	Note 20
Take 01	195.561	198.322	198.012	185.294	165.179	220.396	224.039	211.005	222.715	200.744	180.167	250.154	249.928	220.079	211.232	221.201	110.475	123.947		
Take 02																				
Take 03	199.609	198.521	195.282	183.714	162.914	219.736	222.050	219.772	220.027	194.240	185.256	247.742	248.351	223.498	209.539	220.211	107.017	121.553		
Take 04	197.313	197.153	196.211	184.843	166.248	222.479	220.809	221.755	220.373	194.963	185.658	247.411	248.379	222.481	206.105	220.519	109.547	123.236		
Take 05																				
Take 06	194.560	196.496	195.218	181.967	164.515	221.053	219.413	222.401	218.209	197.563	184.222	246.336	245.801	219.508	207.011	218.424	110.509	122.937		
Take 07	195.236	197.788	198.319	183.182	167.005	222.741	219.958	222.237	218.053	197.251	183.613	247.781	248.862	224.528	208.364	219.731	108.855	122.009		
Take 08	195.540	197.095	197.734	185.102	165.109	223.260	221.454	220.476	221.350	196.792	184.763	245.504	245.996	221.376	209.115	221.529	109.604	123.301		
Take 09	195.716	196.755	195.333	185.113	165.345	221.785	219.298	223.072	218.926	194.654	185.937	249.048	246.739	222.345	209.831	219.522	108.229	123.470		
Take 10	195.267	195.571	199.743	183.000	167.446	221.564	221.843	222.022	221.207	196.198	184.078	248.968	248.365	224.871	209.982	220.411	111.823	123.615		
Take 11	198.649	202.322	190.360	186.957	165.100	221.153	220.966	220.197	219.094	195.387	186.100	248.168	245.530	222.923	209.619	221.286	111.165	122.579		
Take 12	196.075	199.995	198.539	183.694	162.755	222.098	220.537	220.402	218.536	196.437	186.338	246.870	248.778	221.922	207.317	221.429	107.488	123.004		
Take 13	195.046	196.893	198.974	185.503	166.634	223.015	221.735	0.000	221.377	196.696	187.114	252.169	247.432	221.946	206.647	220.387	111.174	123.082		
Take 14	195.151	197.930	196.557	187.888	164.762	220.562	218.304	222.353	219.491	196.633	187.175	248.661	246.787	220.645	204.356	218.553	110.691	122.545		
Take 15	197.835	196.184	194.912	183.245	164.864	220.714	218.658	219.834	218.328	194.979	183.438	250.957	249.360	222.022	206.813	219.306	109.089	123.861		
Take 16	194.772	196.424	197.185	184.262	163.821	220.140	219.828	219.618	218.490	197.395	184.700	248.192	246.297	221.664	205.705	220.326	107.167	122.598		
Take 17	194.847	193.633	196.195	185.857	164.994	220.868	218.207	218.124	219.806	195.791	184.438	244.906	246.272	223.438	208.262	219.716	107.186	122.430		
Take 18	193.383	197.824	193.846	183.632	163.203	220.692	220.816	219.758	221.999	195.750	183.618	243.897	249.619	223.884	207.129	220.111	108.849	123.947		
Take 19	193.781	195.010	195.458	185.072	164.743	223.628	220.353	219.723	221.505	192.988	181.866	245.772	245.444	223.488	208.658	220.365	109.148	122.702		
Take 20	193.696	199.615	197.539	182.160	162.824	222.514	222.490	218.391	219.820	196.645	186.216	246.673	249.997	227.458	208.425	221.703	112.882	122.763		
Take 21	194.293	194.362	194.948	184.543	164.730	223.942	220.826	223.142	218.739	195.878	184.054	250.354	247.932	224.664	206.972	219.784	108.317	121.916		
Bass 1 AVERAGE	195.427	196.976	196.667	184.475	164.852	221.702	220.610	220.781	219.897	196.157	184.671	247.872	247.677	222.776	207.952	220.237	109.241	122.921		

Cents RF+3rds	-5.548	8.124	5.404	-5.390	-0.094	12.845	4.293	5.638	-1.307	0.908	-3.552	6.011	4.653	21.210	1.998	1.370	-12.486	-8.227
Cents RF-3rds	-1.639	12.033	9.313	-1.481	3.815	16.754	8.202	9.547	2.602	4.817	0.357	9.920	8.561	25.118	5.906	5.279	-8.578	-4.318
Just Int I	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Just Int II	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Pythagorean	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	1.955	1.955	-1.955	7.820	5.865	5.865	1.955	11.730	1.955	1.955	5.865
Meantone	-29.219	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	-3.421	-3.421	-3.421	-29.219	-13.686	-10.264	-10.264	-3.421	-20.530	-3.421	3.421	-15.641
Take 01	195.072	197.592	197.177	184.845	165.941	219.750	219.257	219.777	219.274	194.559	186.508	247.088	246.352	222.491	209.286	219.370	109.049	123.285
Take 02																		
Take 03	193.421	197.463	196.332	184.006	167.412	220.661	218.799	217.891	217.961	195.941	184.105	242.168	245.498	220.533	207.854	219.179	108.645	122.224
Take 04	194.675	199.219	198.013	185.043	167.194	221.503	219.183	218.730	216.713	194.454	185.104	245.503	244.046	221.555	206.910	218.800	109.005	122.381
Take 05																		
Take 06	194.200	196.825	195.385	183.483	165.298	218.212	217.700	218.991	217.666	195.080	184.787	247.488	244.210	221.004	207.541	217.768	109.213	121.109
Take 07	193.372	195.664	194.294	185.634	165.158	221.429	218.511	218.426	219.282	193.711	185.214	247.707	244.567	222.663	206.751	219.133	107.635	122.265
Take 08	196.201	198.678	196.690	185.467	165.612	221.146	219.095	220.805	220.265	197.031	188.404	244.849	246.793	221.935	206.243	218.181	109.429	122.735
Take 09	194.544	198.263	195.221	182.548	165.259	216.814	216.511	214.375	214.603	193.977	188.958	249.121	244.907	221.653	207.211	216.816	108.930	122.938
Take 10	194.016	197.491	197.650	183.162	165.116	220.445	218.093	219.761	217.629	194.702	183.825	245.482	244.280	221.632	208.815	216.997	109.908	122.517
Take 11	195.938	196.733	193.113	183.803	165.557	222.700	218.666	218.317	217.837	196.759	184.354	247.202	247.313	220.875	210.146	220.559	109.000	123.052
Take 12	193.992	196.000	195.690	183.190	165.358	221.471	219.192	219.387	220.789	193.566	185.104	244.291	245.641	220.289	207.442	219.407	110.019	122.212
Take 13	195.107	198.320	196.009	183.930	166.169	221.805	218.982	219.345	220.478	193.920	184.914	246.997	246.562	219.945	205.703	217.482	109.313	122.745
Take 14	191.918	194.373	192.987	181.977	164.389	219.912	216.732	221.895	218.263	194.898	184.450	247.511	243.996	221.527	206.960	220.266	110.021	121.700
Take 15	193.024	194.578	196.163	187.380	166.098	220.603	216.492	221.906	216.143	191.458	184.476	243.048	244.065	219.910	206.673	217.506	108.927	121.575
Take 16	193.780	194.511	196.134	182.905	165.270	221.573	216.673	217.294	216.198	195.782	184.143	245.134	243.893	221.909	206.584	217.881	110.349	121.953
Take 17	193.171	196.191	193.724	185.274	163.980	221.955	216.945	220.021	217.260	194.284	185.092	246.649	245.092	220.814	205.774	218.292	109.763	123.662
Take 18	194.315	194.315	194.938	183.186	163.857	217.961	215.877	219.094	217.420	192.134	184.609	242.215	244.135	221.019	207.979	219.205	108.856	121.996
Take 19	194.322	195.839	195.143	183.477	165.029	217.087	215.866	218.733	217.385	190.522	184.373	246.861	243.762	219.918	206.770	218.715	109.083	120.733
Take 20	192.632	195.077	194.725	185.726	164.147	220.159	218.820	216.563	217.454	191.282	186.259	245.319	246.678	222.178	209.647	218.507	108.972	122.154
Take 21	192.988	195.673	194.314	182.679	164.177	221.279	216.684	216.701	215.593	192.454	184.673	246.100	244.252	219.155	206.259	219.014	109.862	122.366
Bass 2 AVERAGE	**194.036**	**196.463**	**195.458**	**184.090**	**165.317**	**220.340**	**217.794**	**218.843**	**217.801**	**194.027**	**185.229**	**245.828**	**245.055**	**221.106**	**207.397**	**218.583**	**109.262**	**122.295**
Cents RF+3rds	-17.910	3.611	-5.271	-9.005	4.780	2.179	-17.948	-9.628	-17.892	-17.992	1.671	-8.321	-13.775	8.181	-2.625	-11.684	-12.150	-17.066
Cents RF-3rds	-14.001	7.520	-1.362	-5.096	8.689	6.088	-14.039	-5.719	-13.983	-14.083	5.579	-4.412	-9.866	12.090	1.284	-7.775	-8.241	-13.157
Just Int I	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Just Int II	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Pythagorean	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	1.955	1.955	-1.955	7.820	5.865	5.865	1.955	11.730	1.955	1.955	5.865
Meantone	-29.219	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	-3.421	-3.421	-29.219	-13.686	-10.264	-10.264	-3.421	-20.530	-3.421	3.421	-15.641
Take 01	193.244	196.420	196.231	186.597	166.705	221.877	220.833	220.166	218.854	194.439	186.842	247.538	244.563	222.199	208.744	221.152	110.112	125.316
Take 02																		
Take 03	194.752	197.615	194.824	184.293	165.000	220.084	218.314	217.407	217.613	193.817	186.376	239.743	244.650	220.298	206.984	221.451	108.488	121.869
Take 04	193.708	198.947	197.758	185.174	165.122	224.499	219.072	219.807	220.724	192.857	187.477	246.354	240.855	222.222	208.683	219.154	108.429	121.329
Take 05																		
Take 06	192.501	195.020	194.968	184.050	164.235	220.770	217.917	217.404	214.677	191.855	186.714	244.346	243.619	218.163	206.696	217.308	108.491	122.001
Take 07	192.492	194.142	195.279	182.988	166.273	219.133	217.949	217.973	216.022	192.506	185.344	244.351	243.869	216.877	208.101	218.115	107.736	123.548
Take 08	193.073	195.786	192.739	185.698	164.021	217.022	218.502	218.245	216.008	190.579	185.481	244.674	243.617	222.251	205.215	218.993	108.884	122.774
Take 09	193.007	195.725	195.609	185.121	164.854	221.290	218.619	220.320	215.189	194.149	184.068	247.049	243.047	223.216	208.785	220.445	107.364	123.905
Take 10	195.368	194.870	197.139	185.936	165.707	218.440	218.861	217.178	216.168	194.146	184.789	248.895	243.623	220.730	206.237	219.182	108.969	123.501
Take 11	194.426	198.955	192.998	182.547	167.752	220.370	219.810	221.864	217.861	193.086	183.540	244.909	244.703	223.601	207.507	219.440	109.931	123.138
Take 12	195.164	196.569	195.944	186.885	165.330	220.396	220.085	218.018	214.593	192.258	182.777	245.293	245.266	221.846	208.384	219.990	108.449	122.227
Take 13	193.218	194.252	194.611	185.693	167.925	222.528	220.276	220.414	217.754	194.596	188.277	240.984	244.464	220.475	207.399	218.305	108.496	123.057
Take 14	191.225	194.280	193.655	184.551	165.365	216.931	217.106	217.839	217.289	193.168	186.007	248.096	244.111	220.500	206.553	217.654	108.032	120.716
Take 15	192.891	196.395	194.728	185.342	164.538	219.742	217.888	217.292	217.016	192.515	183.356	246.751	242.648	220.687	208.337	217.462	108.072	121.536
Take 16	191.965	194.422	194.104	185.326	164.600	223.357	218.435	217.385	217.440	193.940	185.649	246.909	245.791	220.542	207.649	218.435	107.088	122.337
Take 17	193.070	193.487	193.781	183.274	166.075	217.027	217.890	218.386	217.143	192.546	185.660	235.976	241.996	220.926	206.845	219.202	109.830	121.765
Take 18	193.848	190.233	191.703	183.903	164.850	218.711	217.353	217.241	216.274	193.622	182.447	243.084	244.251	221.100	203.721	217.131	107.380	121.801
Take 19	193.210	192.508	192.180	183.074	167.053	216.504	216.386	217.517	215.405	192.077	183.218	245.479	241.852	217.992	206.344	218.723	107.765	120.883
Take 20	192.110	193.036	193.375	181.326	163.932	221.249	217.381	218.099	214.919	194.052	183.613	247.328	246.277	219.738	207.798	218.215	109.299	121.063

Take 21	192.847	195.195	192.928	184.712	166.195	221.827	217.779	216.932	214.215	192.760	186.172	247.753	244.324	217.379	204.916	219.310	109.025	121.934
Bass 3 AVERAGE	193.269	195.151	194.450	184.552	165.554	220.093	218.445	218.394	216.588	193.104	185.148	245.027	243.870	220.565	207.100	218.930	108.518	122.353
Cents RF+3rds	-24.766	-7.996	-14.221	-4.668	7.264	0.231	-12.777	-13.181	-27.560	-26.251	0.911	-13.973	-22.168	3.947	-5.110	-8.940	-23.981	-16.245
Cents RF-3rds	-20.857	-4.087	-10.312	-0.759	11.173	4.140	-8.868	-9.272	-23.652	-22.342	4.819	-10.064	-18.259	7.855	-1.201	-5.031	-20.073	-12.337
Just Int I	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Just Int II	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Pythagorean	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	1.955	1.955	-1.955	7.820	5.865	5.865	1.955	11.730	1.955	1.955	5.865
Meantone	-29.219	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	-3.421	-3.421	-29.219	-13.686	-10.264	-10.264	-3.421	-20.530	-3.421	3.421	-15.641
Take 01	195.417	194.669	194.390	183.667	165.460	225.197	221.110	223.607	218.193	196.875	186.649	249.963	250.278	224.623	210.343	223.361	110.006	124.137
Take 02																		
Take 03	196.504	195.763	196.662	184.970	168.092	221.842	219.438	222.153	220.306	194.220	185.621	253.021	247.001	220.741	209.141	223.014	109.094	122.866
Take 04	197.401	197.018	198.461	185.248	166.976	223.055	220.965	222.486	220.160	195.560	184.086	251.167	249.279	222.895	209.494	221.995	109.197	123.555
Take 05																		
Take 06	193.371	195.367	194.478	186.151	164.873	222.517	219.693	220.621	219.011	193.570	191.361	244.786	244.414	219.014	207.311	221.550	108.656	122.776
Take 07	194.222	194.917	194.473	183.070	165.129	221.738	219.431	223.059	219.791	192.810	183.897	247.995	247.600	220.612	209.491	221.644	107.422	123.665
Take 08	194.733	196.567	194.485	182.960	165.066	221.747	219.831	222.212	218.905	189.963	189.439	245.241	247.307	222.713	207.771	220.710	107.605	122.830
Take 09	197.717	197.679	197.195	185.458	162.842	218.741	219.839	219.710	217.804	195.440	191.126	250.699	246.255	216.934	208.237	220.393	109.292	122.603
Take 10	195.135	195.836	196.110	185.878	167.268	221.351	219.881	220.995	221.836	195.332	186.920	250.126	248.037	224.213	210.571	222.620	111.095	123.965
Take 11	197.109	193.954	194.849	183.158	165.855	218.583	220.356	219.086	219.597	194.719	188.327	247.556	249.157	223.750	210.887	223.207	111.521	124.806
Take 12	194.981	194.741	196.559	185.798	167.064	221.398	219.683	220.261	219.275	193.529	185.569	248.947	248.674	224.856	210.587	221.643	110.460	123.999
Take 13	194.412	196.697	196.850	184.730	165.761	223.349	220.807	221.307	220.282	195.318	188.187	249.588	249.609	223.784	208.179	221.579	109.624	123.096
Take 14	192.520	194.221	194.410	184.615	165.008	219.724	220.204	219.795	219.085	194.137	186.893	247.511	246.615	222.627	210.933	220.857	108.998	123.241
Take 15	193.561	195.979	193.991	182.550	163.383	220.743	219.101	218.910	219.204	192.317	186.841	248.315	246.018	224.705	204.146	221.791	108.468	123.236
Take 16	193.552	196.122	192.982	184.895	165.519	221.862	218.335	219.381	218.630	192.333	186.434	251.779	248.136	222.295	206.568	220.244	109.281	123.643
Take 17	193.261	195.692	193.595	183.779	165.273	222.324	219.700	219.485	218.993	192.954	188.129	247.059	245.030	221.323	205.710	221.283	109.395	122.859
Take 18	195.441	194.478	197.331	184.288	166.616	221.464	218.956	220.960	217.428	193.166	187.534	244.900	248.167	221.593	207.871	219.608	108.751	122.948
Take 19	192.814	195.777	193.662	183.892	163.426	220.627	218.100	221.334	216.712	194.137	184.279	247.150	247.131	221.790	208.321	220.140	109.647	123.200
Take 20	194.451	195.554	195.935	183.268	164.571	223.033	218.962	219.133	216.940	193.039	189.240	246.208	248.613	220.998	209.787	221.075	109.409	124.393
Take 21	193.225	195.054	195.290	183.718	165.137	220.020	218.864	219.321	219.623	192.601	186.172	246.869	247.691	222.677	207.222	222.094	107.627	124.344
Bass 4 AVERAGE	194.728	195.583	195.353	184.321	165.438	221.543	219.645	220.727	219.041	193.790	186.963	248.362	247.632	222.218	208.556	221.516	109.239	123.482
Cents RF+3rds	-11.751	-4.160	-6.202	-6.839	6.045	11.602	-3.292	5.217	-8.062	-20.104	17.806	9.433	4.337	16.871	7.024	11.394	-12.509	-0.337
Cents RF-3rds	-7.842	-0.251	-2.293	-2.930	9.953	15.511	0.617	9.125	-4.153	-16.195	21.715	13.342	8.246	20.779	10.932	15.302	-8.601	3.572
Just Int I	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Just Int II	-1.955	-1.955	-1.955	-13.686	-17.596	1.955	1.955	1.955	1.955	-1.955	-13.686	-15.641	-15.641	1.955	-9.776	1.955	1.955	-15.641
Pythagorean	-1.955	-1.955	-1.955	7.820	3.910	1.955	1.955	1.955	1.955	-1.955	7.820	5.865	5.865	1.955	11.730	1.955	1.955	5.865
Meantone	-29.219	-29.219	-29.219	-13.686	-6.843	-3.421	-3.421	-3.421	-3.421	-29.219	-13.686	-10.264	-10.264	-3.421	-20.530	-3.421	3.421	-15.641

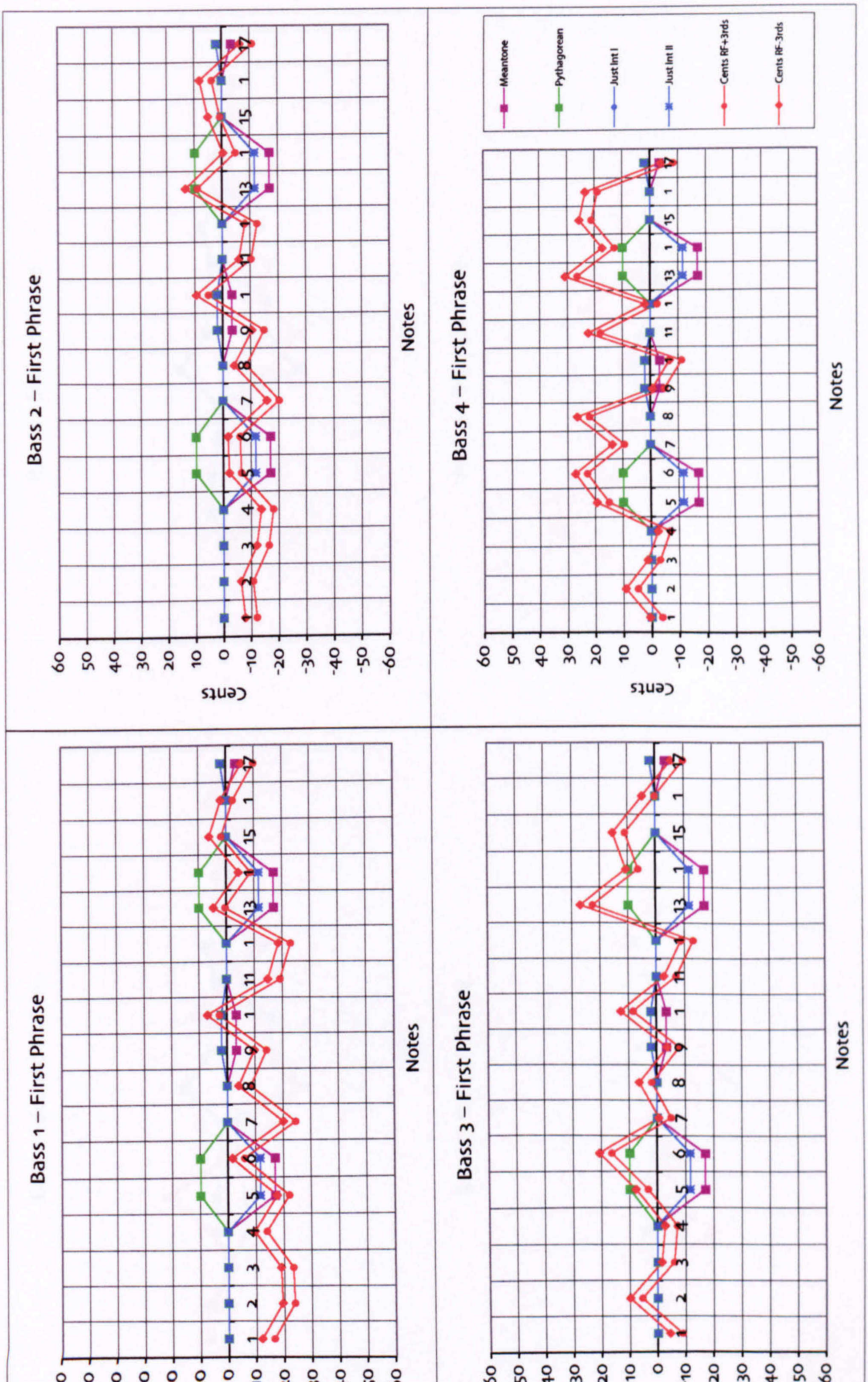
Fifth Phrase

	Note 01	Note 02	Note 03	Note 04	Note 05	Note 06	Note 07	Note 08	Note 09	Note 10	Note 11	Note 12	Note 13	Note 14	Note 15	Note 16
Take 01	223.449	234.589	222.303	207.515	196.450	187.354	124.257	111.234	109.525	148.177						
Take 02																
Take 03	219.118	232.514	220.052	205.986	194.896	189.290	123.876	108.982	108.370	146.614						
Take 04	222.057	232.652	220.884	208.999	198.586	186.435	124.315	111.046	108.935	146.827						
Take 05																
Take 06	218.216	233.757	218.819	207.344	196.146	189.586	123.313	112.075	109.108	147.308						
Take 07	220.404	231.811	221.161	207.881	197.111	186.005	121.918	108.161	113.188	146.946						
Take 08	221.343	228.801	219.704	206.924	197.879	183.790	125.186	109.300	109.326	146.209						
Take 09	220.380	234.183	221.772	207.511	197.077	189.560	121.958	109.153	109.774	146.997						
Take 10	220.102	230.468	220.701	207.423	195.602	188.528	126.598	109.131	110.624	147.285						
Take 11	221.836	233.120	220.743	206.562	194.184	187.290	125.193	108.286	110.083	148.161						
Take 12	223.313	234.149	222.286	207.745	198.029	188.193	125.889	108.768	108.735	146.818						
Take 13	222.637	233.231	222.065	209.479	197.331	185.713	122.580	109.865	110.942	146.580						
Take 14	226.154	232.792	219.827	206.704	195.332	186.571	122.190	109.208	111.567	146.665						
Take 15	220.041	231.029	218.797	207.647	195.032	188.143	121.495	110.056	109.706	146.922						
Take 16	218.817	230.633	219.378	206.550	195.115	187.050	123.191	108.428	109.406	146.843						

Take 17	222.331	233.090	218.621	206.889	197.012	187.049	126.000	110.311	109.229	146.599
Take 18	219.357	232.372	218.529	206.576	195.996	185.482	124.630	108.465	109.691	146.893
Take 19	219.175	232.767	219.820	206.864	196.831	188.472	125.348	109.349	110.510	145.753
Take 20	215.954	234.305	218.764	206.255	195.837	185.216	122.980	106.433	109.167	146.710
Take 21	220.016	232.564	217.142	206.989	196.676	190.299	123.129	106.715	112.805	145.552
Bass 1 AVERAGE	**220.348**	**232.570**	**220.072**	**207.255**	**196.375**	**187.370**	**123.897**	**109.519**	**110.036**	**146.835**
Cents RF+3rds	-1.353	-7.893	-3.521	-7.403	-0.759	17.974	1.880	-11.677	-3.514	-4.061
Cents RF-3rds	-0.868	-7.409	-3.036	-6.918	-0.274	18.459	2.365	-11.192	-3.029	-3.576
Just Int I	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Just Int II	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Pythagorean	1.955	-7.820	1.955	11.730	-1.955	7.820	5.865	1.955	1.955	0.000
Meantone	-3.421	13.686	-3.421	-20.530	3.422	-13.686	-10.264	-3.421	-3.421	0.000
Take 01	221.242	234.293	219.531	206.579	196.612	188.453	122.821	110.772	110.387	147.430
Take 02										
Take 03	221.216	232.726	218.961	206.292	194.017	186.188	123.352	109.763	110.018	146.950
Take 04	218.972	233.958	220.759	206.084	195.300	187.638	122.285	109.524	109.757	147.137
Take 05										
Take 06	218.837	232.647	220.172	206.890	193.575	187.923	122.615	108.999	109.512	146.813
Take 07	222.312	233.684	218.958	205.782	194.325	187.719	122.903	109.570	110.201	146.463
Take 08	218.949	232.449	218.163	206.401	194.656	184.536	124.246	109.608	109.772	146.838
Take 09	218.602	233.625	219.470	206.875	195.154	189.464	124.126	109.642	109.891	147.185
Take 10	219.826	233.596	220.232	206.431	194.459	186.514	122.792	110.261	110.624	146.696
Take 11	221.882	234.722	221.486	206.723	194.251	186.316	126.231	110.133	111.035	147.449
Take 12	220.705	232.576	220.217	207.187	193.022	187.660	124.287	110.339	109.983	146.806
Take 13	220.546	234.179	220.279	206.052	195.177	185.627	121.763	109.907	110.073	146.872
Take 14	220.520	233.365	218.865	206.744	195.116	185.551	122.132	108.596	108.839	146.433
Take 15	219.296	231.398	219.467	205.837	195.373	185.810	122.413	108.914	109.384	146.765
Take 16	220.951	233.673	217.454	208.172	195.144	184.910	122.318	109.201	109.425	146.004
Take 17	220.426	233.309	218.304	205.658	193.794	186.757	123.013	109.433	109.396	145.841
Take 18	219.666	232.240	218.719	205.080	192.947	183.521	122.688	109.727	110.040	145.793
Take 19	221.474	231.685	219.714	205.107	194.896	189.042	121.961	109.205	109.786	146.579
Take 20	220.569	233.736	221.157	206.199	193.373	186.147	121.149	108.896	108.739	145.477
Take 21	219.427	232.617	218.410	206.444	194.268	184.925	122.089	109.503	109.460	145.491
Bass 2 AVERAGE	**220.285**	**233.183**	**219.490**	**206.344**	**194.498**	**186.563**	**122.904**	**109.578**	**109.806**	**146.580**
Cents RF+3rds	-1.844	-3.335	-8.101	-15.029	-17.386	10.507	-12.048	-10.735	-7.135	-7.063
Cents RF-3rds	-1.359	-2.850	-7.616	-14.544	-16.901	10.992	-11.563	-10.250	-6.650	-6.578
Just Int I	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Just Int II	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Pythagorean	1.955	-7.820	1.955	11.730	-1.955	7.820	5.865	1.955	1.955	0.000
Meantone	-3.421	13.686	-3.421	-20.530	3.422	-13.686	-10.264	-3.421	-3.421	0.000
Take 01	223.596	231.899	218.942	207.511	194.639	187.057	123.657	111.041	110.485	148.313
Take 02										
Take 03	221.365	229.705	217.180	204.471	194.041	188.213	122.170	109.929	109.385	147.588
Take 04	219.461	230.215	217.782	205.408	194.624	184.688	122.229	109.548	109.630	146.615
Take 05										
Take 06	218.984	230.316	218.208	203.340	194.004	185.324	123.618	109.594	110.247	146.760
Take 07	219.424	230.795	218.464	207.401	195.381	186.717	122.513	109.381	108.539	146.910
Take 08	220.372	230.765	219.560	205.613	194.933	187.350	124.264	109.207	108.670	146.980
Take 09	219.017	230.894	218.254	206.162	195.059	187.378	122.668	108.852	109.057	146.437
Take 10	221.169	230.502	218.281	204.448	195.547	187.195	122.285	109.193	109.155	146.722
Take 11	219.277	232.018	220.478	206.842	193.879	187.677	124.042	110.083	110.465	147.447
Take 12	218.463	230.668	219.399	205.682	193.848	185.942	122.091	109.476	109.141	146.740
Take 13	220.786	231.360	218.914	205.248	192.183	185.407	123.130	109.030	107.968	147.107
Take 14	220.718	230.362	218.625	204.821	195.706	185.836	122.355	107.733	107.767	146.001

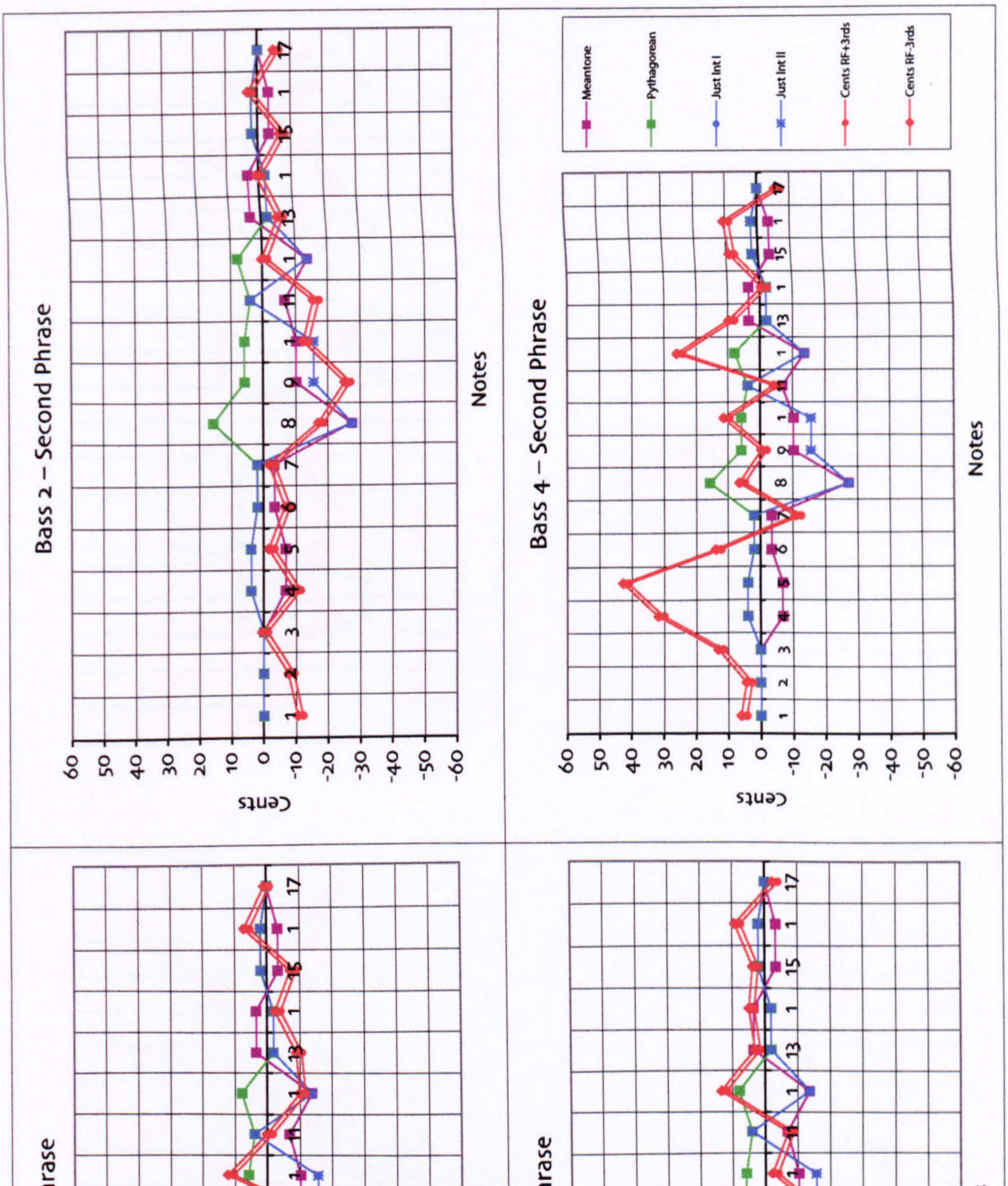
Take 15	217.872	229.204	217.585	205.151	194.496	187.382	122.750	108.292	107.774	145.964
Take 16	218.099	229.622	217.189	204.264	195.502	186.810	123.452	108.513	108.354	145.636
Take 17	217.246	228.379	215.326	207.440	195.494	185.863	120.360	108.358	108.550	145.657
Take 18	215.229	226.436	213.893	201.257	191.941	183.758	120.734	108.113	108.033	145.727
Take 19	217.096	230.239	215.680	204.070	194.313	191.332	120.127	108.677	108.156	146.551
Take 20	221.994	233.952	218.212	204.255	190.839	184.752	121.492	108.512	108.626	146.705
Take 21	220.724	230.712	217.705	206.051	193.784	185.587	122.112	109.336	108.391	146.346
Bass 3 AVERAGE	**219.521**	**230.423**	**217.878**	**205.233**	**194.222**	**186.540**	**122.424**	**109.098**	**108.863**	**146.642**
Cents RF+3rds	-7.864	-23.947	-20.869	-24.372	-19.846	10.294	-18.831	-18.336	-22.079	-6.328
Cents RF-3rds	-7.379	-23.463	-20.384	-23.887	-19.361	10.779	-18.346	-17.851	-21.594	-5.843
Just Int I	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Just Int II	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Pythagorean	1.955	-7.820	1.955	11.730	-1.955	7.820	5.865	1.955	1.955	0.000
Meantone	-3.421	13.686	-3.421	-20.530	3.422	-13.686	-10.264	-3.421	-3.421	0.000
Take 01	222.116	234.095	222.622	211.127	196.571	188.060	124.954	111.943	110.215	148.392
Take 02										
Take 03	220.179	232.140	219.593	210.257	196.960	187.072	122.415	110.018	110.921	147.145
Take 04	220.529	233.325	220.136	209.341	199.451	188.315	122.494	109.980	109.292	146.891
Take 05										
Take 06	220.292	232.816	220.704	208.839	195.049	184.114	124.036	109.580	110.346	147.505
Take 07	221.539	233.950	220.086	208.197	197.448	188.337	124.862	108.826	109.484	147.466
Take 08	223.122	234.223	221.747	209.179	194.471	188.276	125.531	109.871	109.732	147.310
Take 09	221.128	232.209	222.493	208.221	195.484	186.512	123.555	108.942	110.331	147.473
Take 10	222.543	233.197	219.771	210.252	197.796	185.999	125.313	109.568	110.090	147.719
Take 11	221.629	233.936	222.240	210.055	195.926	186.170	123.930	110.040	109.709	147.775
Take 12	225.370	235.459	221.864	211.748	197.098	186.299	123.284	110.077	110.329	147.252
Take 13	222.212	236.597	222.154	211.234	196.957	188.507	123.993	109.941	109.724	147.192
Take 14	222.467	232.709	221.428	209.050	195.547	184.573	123.718	109.642	111.071	146.667
Take 15	221.438	232.148	219.943	208.873	196.878	187.228	122.033	109.196	109.956	146.473
Take 16	220.235	233.992	218.507	207.809	195.615	187.248	124.138	108.808	107.631	146.059
Take 17	220.271	233.853	218.695	208.086	195.707	188.633	121.363	109.512	109.673	146.543
Take 18	223.605	232.579	218.838	208.649	195.429	184.619	121.839	108.702	108.419	146.482
Take 19	219.646	234.172	220.244	208.694	196.784	187.382	122.550	109.559	109.371	147.043
Take 20	222.573	236.824	220.244	211.498	197.001	188.506	124.996	110.309	109.595	146.462
Take 21	223.341	234.250	220.373	210.749	196.426	186.760	123.457	110.271	110.504	146.654
Bass 4 AVERAGE	**221.802**	**233.815**	**220.615**	**209.571**	**196.453**	**186.979**	**123.603**	**109.726**	**109.810**	**147.079**
Cents RF+3rds	10.035	1.346	0.744	11.839	-0.073	14.365	-2.231	-8.412	-7.077	-1.179
Cents RF-3rds	10.519	1.831	1.229	12.324	0.412	14.850	-1.746	-7.927	-6.592	-0.694
Just Int I	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Just Int II	1.955	13.686	-25.309	-9.776	-29.219	-13.686	-15.641	1.955	1.955	0.000
Pythagorean	1.955	-7.820	1.955	11.730	-1.955	7.820	5.865	1.955	1.955	0.000
Meantone	-3.421	13.686	-3.421	-20.530	3.422	-13.686	-10.264	-3.421	-3.421	0.000

11.7 - THE BBC SINGERS BASSES' RESULTS



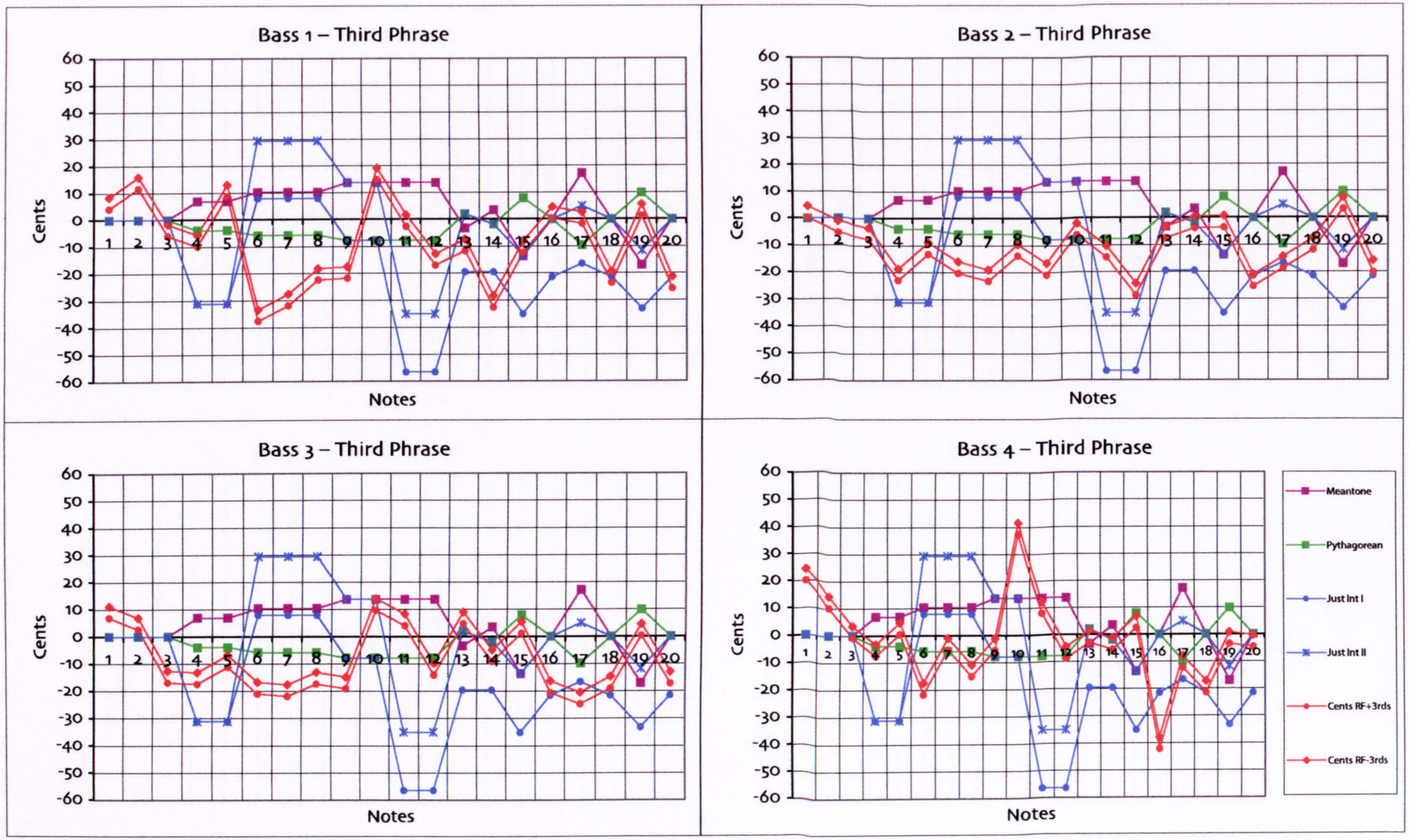
11.7A - THE BBC SINGERS BASSES' CHARTS – PHRASE 1

11.7A - THE BBC SINGERS BASSES' CHARTS – PHRASE 1

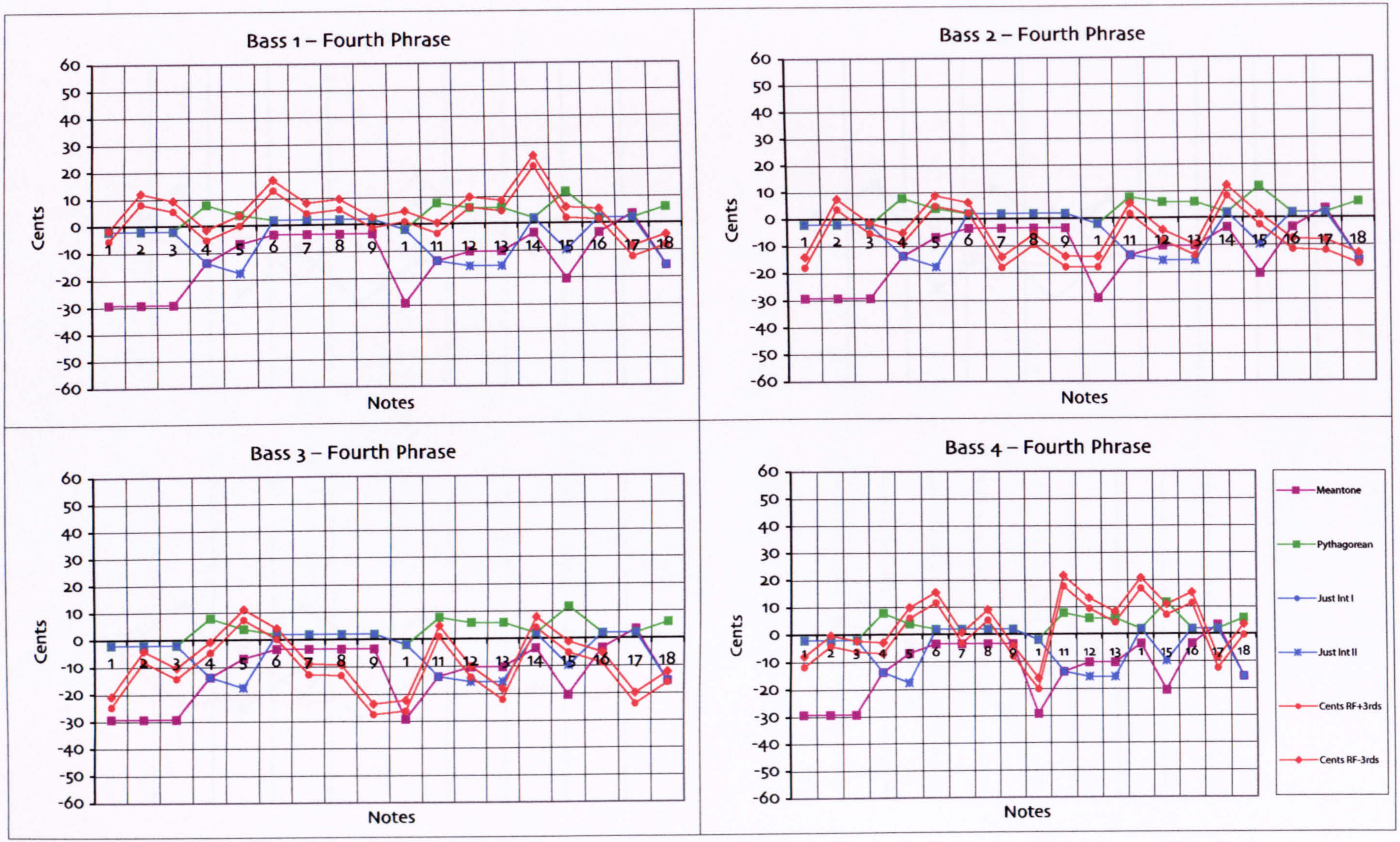


11.7B - THE BBC SINGERS BASSES' CHARTS – PHRASE 2

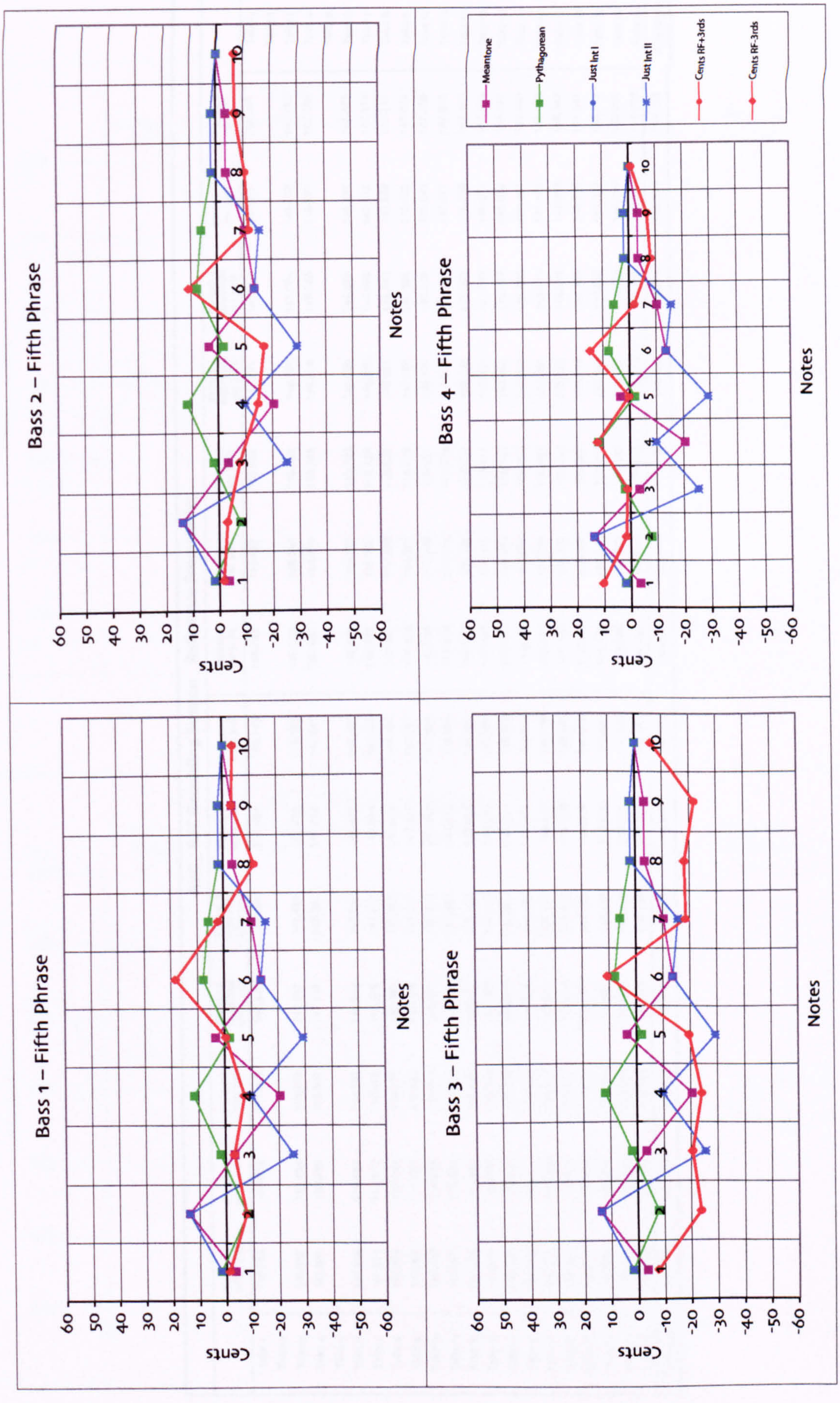
11.7B - THE BBC SINGERS BASSES' CHARTS – PHRASE 2


Bass 1 – Third Phrase
Bass 2 – Third Phrase
Bass 3 – Third Phrase
Bass 4 – Third Phrase
Cents
Notes
Meantone
Pythagorean
Just Int I
Just Int II
Cents RF+3rds
Cents RF-3rds

11.7c - The BBC Singers basses' charts – Phrase 3


Bass 1 – Fourth Phrase
Bass 2 – Fourth Phrase
Bass 3 – Fourth Phrase
Bass 4 – Fourth Phrase
Cents
Notes
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
1 2 3 4 5 6 7 8 9 1 11 12 13 14 15 16 17 18
Meantone
Pythagorean
Just Int I
Just Int II
Cents RF+3rds
Cents RF-3rds

11.7D - The BBC Singers basses' charts – Phrase 4

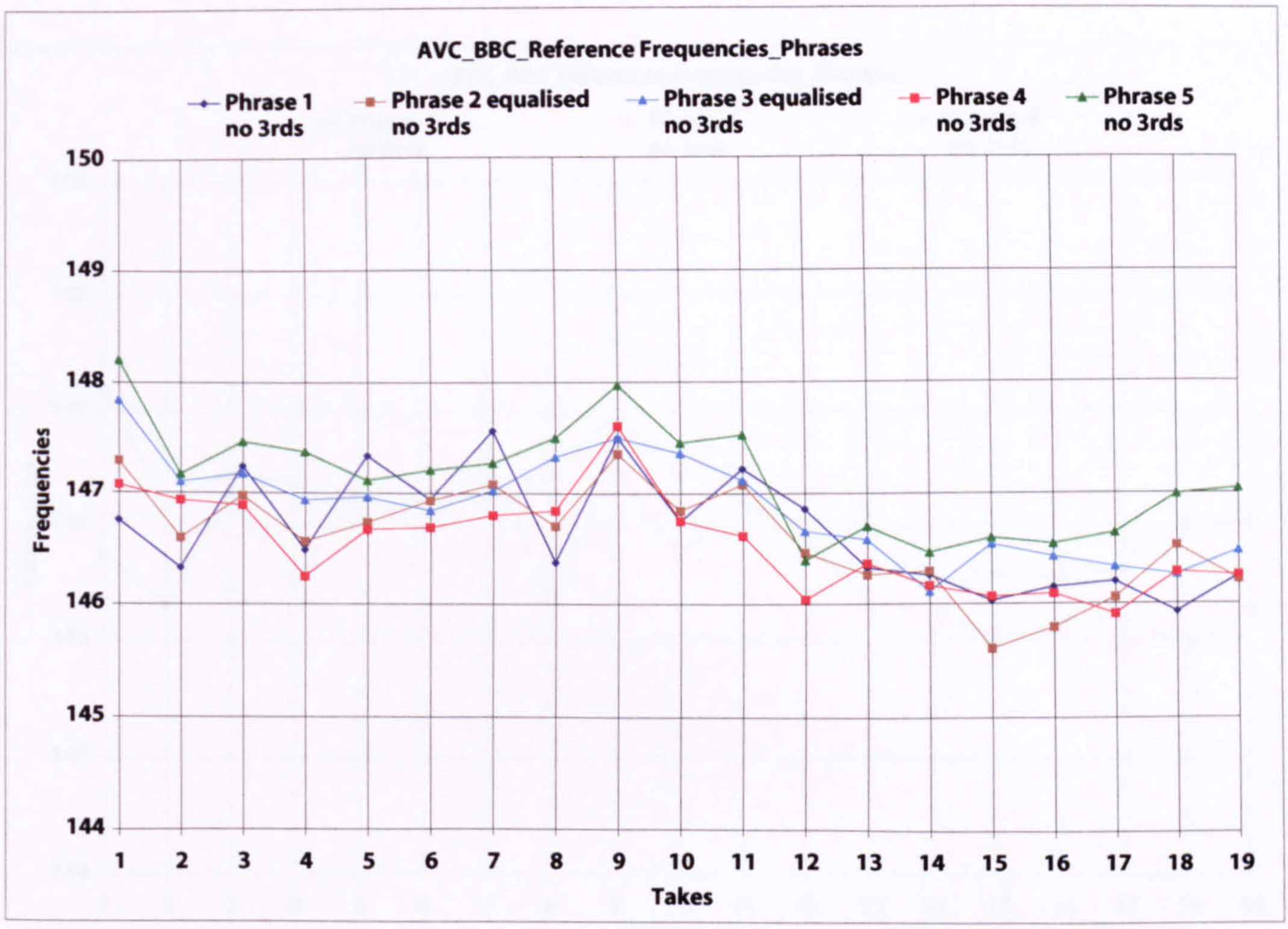


11.7E - THE BBC SINGERS BASSES' CHARTS – PHRASE 5

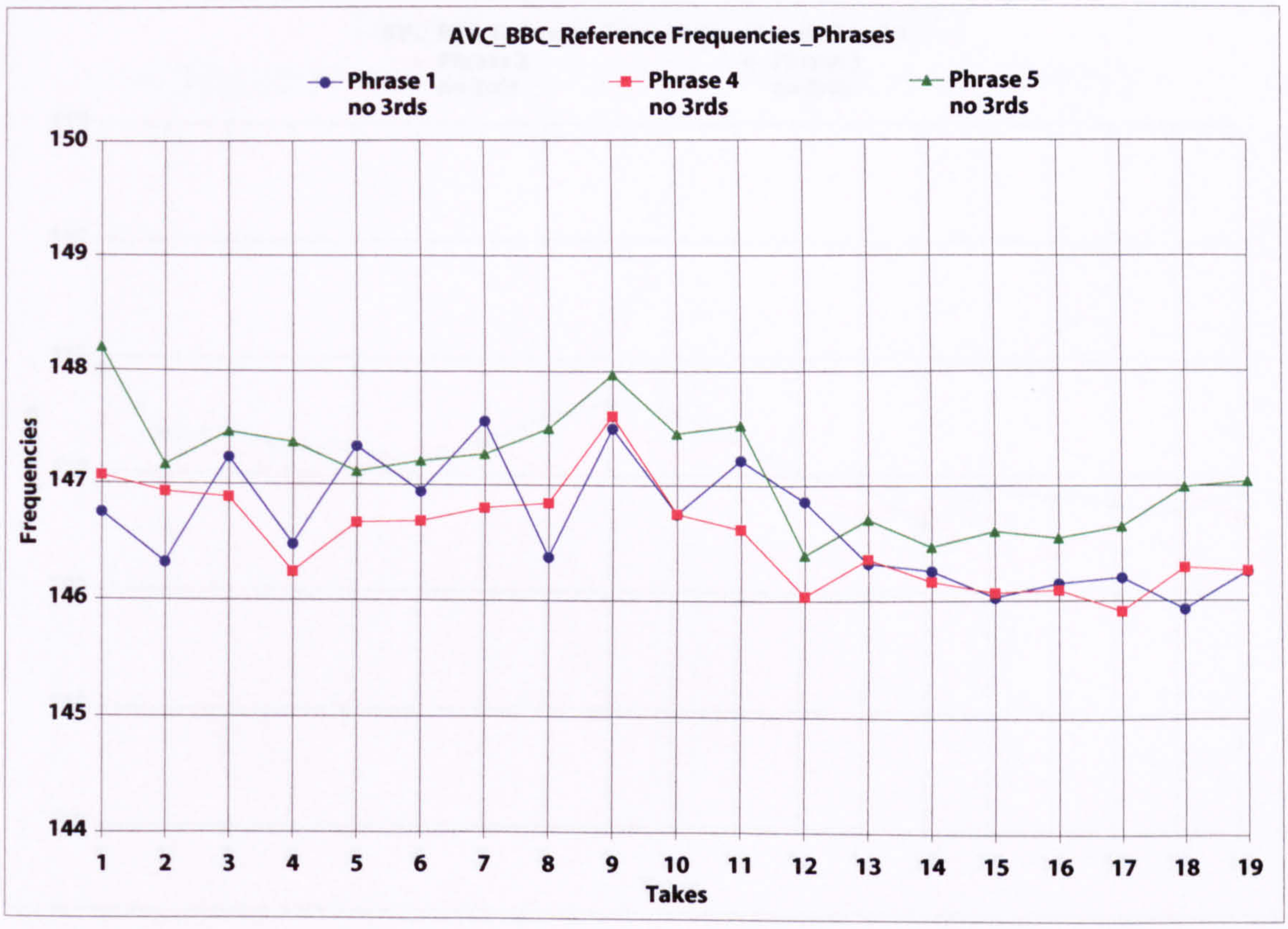
11.7E - THE BBC SINGERS BASSES' CHARTS – PHRASE 5

AVC _ BBC Recording Session _ Reference Frequencies															
	Phrase 1 with 3rds	Phrase 2 with 3rds	Phrase 3 with 3rds	Phrase 2 equalised with 3rds	Phrase 3 equalised with 3rds	Phrase 4 with 3rds	Phrase 5 with 3rds	Phrase 1 no 3rds	Phrase 2 no 3rds	Phrase 3 no 3rds	Phrase 2 equalised no 3rds	Phrase 3 equalised no 3rds	Phrase 4 no 3rds	Phrase 5 no 3rds	
Take 1	146.996	110.619	111.065	147.492	148.086	147.604	148.145	146.752	110.469	110.882	147.291	147.843	147.072	148.201	Take 1
Take 2															Take 2
Take 3	146.662	110.184	110.572	146.912	147.430	147.213	147.195	146.323	109.945	110.328	146.594	147.104	146.933	147.167	Take 3
Take 4	147.631	110.359	110.641	147.146	147.521	147.217	147.531	147.242	110.232	110.385	146.976	147.180	146.891	147.466	Take 4
Take 5															Take 5
Take 6	146.916	110.022	110.431	146.696	147.241	146.477	147.431	146.483	109.920	110.203	146.560	146.937	146.248	147.375	Take 6
Take 7	147.621	110.112	110.469	146.816	147.292	146.974	147.135	147.343	110.052	110.224	146.736	146.965	146.672	147.114	Take 7
Take 8	147.374	110.224	110.376	146.965	147.168	147.013	147.203	146.945	110.200	110.132	146.934	146.843	146.689	147.211	Take 8
Take 9	147.860	110.385	110.633	147.179	147.511	147.131	147.261	147.569	110.313	110.269	147.084	147.026	146.803	147.276	Take 9
Take 10	146.732	110.225	110.817	146.967	147.756	147.240	147.500	146.374	110.026	110.501	146.702	147.334	146.843	147.500	Take 10
Take 11	147.817	110.622	110.924	147.496	147.898	147.734	148.029	147.504	110.519	110.628	147.359	147.504	147.611	147.972	Take 11
Take 12	147.058	110.251	110.820	147.001	147.759	147.012	147.482	146.747	110.132	110.524	146.843	147.365	146.750	147.455	Take 12
Take 13	147.579	110.396	110.593	147.194	147.457	146.993	147.601	147.222	110.311	110.341	147.081	147.121	146.617	147.526	Take 13
Take 14	147.148	109.869	110.140	146.491	146.854	146.294	146.468	146.860	109.845	109.993	146.460	146.657	146.043	146.391	Take 14
Take 15	146.782	109.774	110.137	146.365	146.849	146.617	146.670	146.323	109.697	109.935	146.263	146.580	146.361	146.700	Take 15
Take 16	146.729	109.760	109.891	146.347	146.521	146.474	146.556	146.258	109.721	109.585	146.295	146.113	146.165	146.462	Take 16
Take 17	146.458	109.317	110.217	145.756	146.956	146.459	146.642	146.030	109.207	109.906	145.609	146.541	146.068	146.597	Take 17
Take 18	146.521	109.607	110.100	146.143	146.799	146.516	146.560	146.152	109.346	109.822	145.794	146.430	146.096	146.541	Take 18
Take 19	146.662	109.697	110.098	146.262	146.798	146.229	146.693	146.199	109.543	109.751	146.058	146.335	145.912	146.642	Take 19
Take 20	146.344	109.906	110.031	146.541	146.709	146.672	147.162	145.930	109.896	109.699	146.527	146.266	146.289	146.990	Take 20
Take 21	146.672	109.765	110.181	146.353	146.908	146.745	147.145	146.253	109.664	109.862	146.218	146.483	146.260	147.039	Take 21
Averages	147.030	110.057	110.428	146.743	147.238	146.875	147.179	146.658	109.949	110.156	146.599	146.875	146.543	147.138	Averages

11.8 – THE BBC SINGERS REFERENCE FREQUENCIES' RESULTS

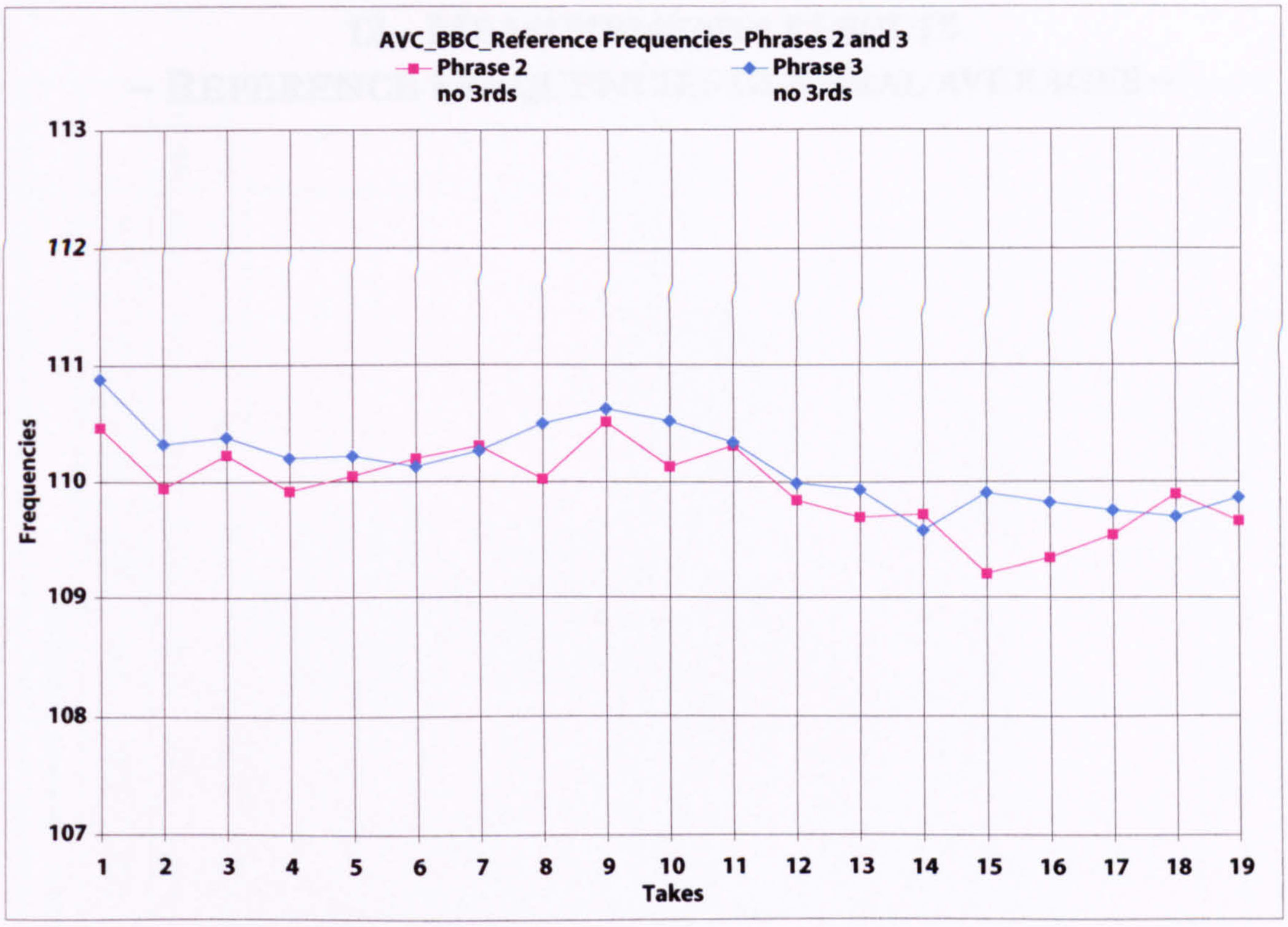

AVC_BBC_Reference Frequencies_Phrases
Phrase 1 no 3rds
Phrase 2 equalised no 3rds
Phrase 3 equalised no 3rds
Phrase 4 no 3rds
Phrase 5 no 3rds
150
149
148
147
146
145
144
Frequencies
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Takes

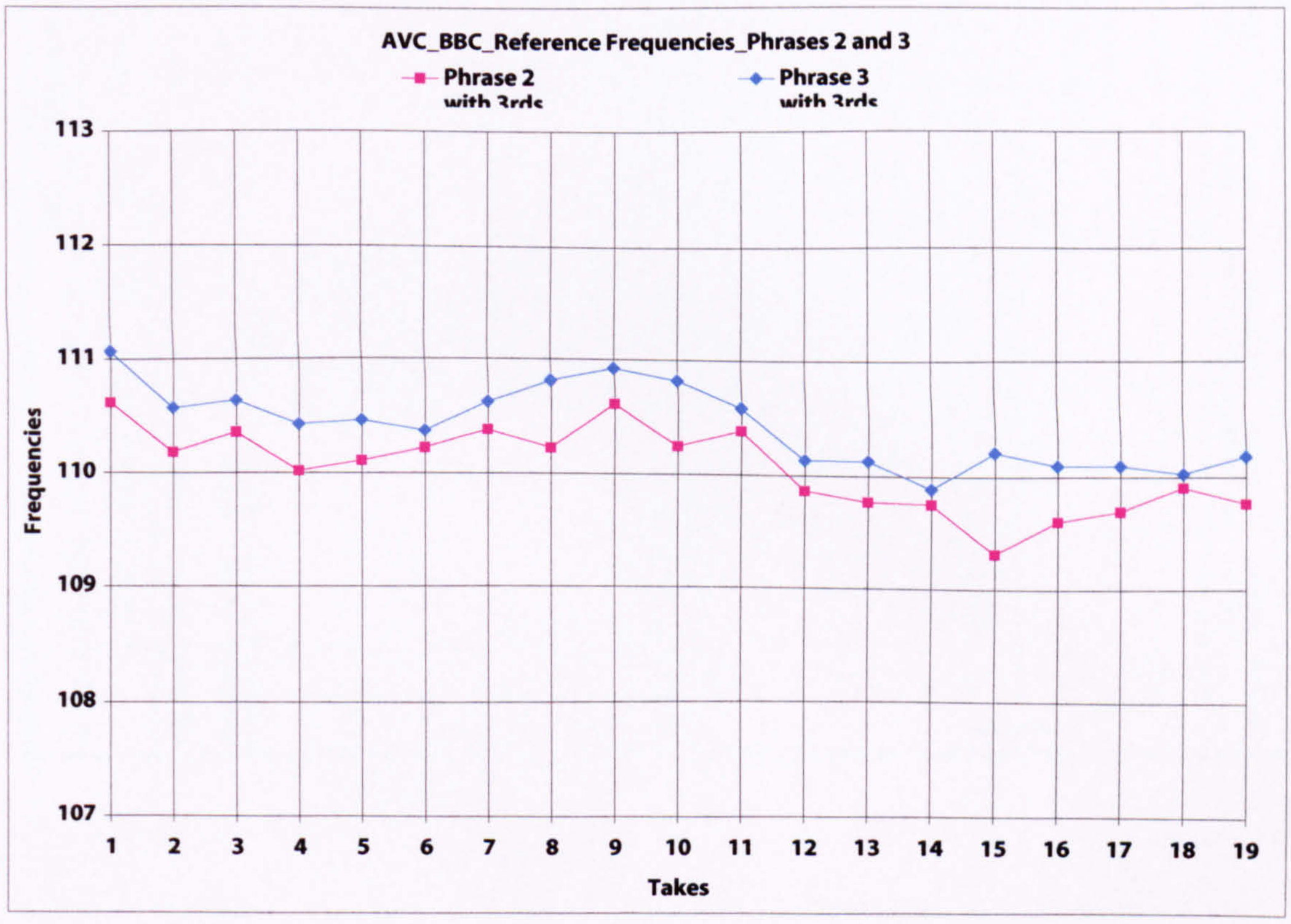
AVC_BBC_Reference Frequencies_Phrases
Phrase 1 with 3rds
Phrase 2 equalised with 3rds
Phrase 3 equalised with 3rds
Phrase 4 with 3rds
Phrase 5 with 3rds
150
149
148
147
146
145
144
Frequencies
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Takes


AVC_BBC_Reference Frequencies_Phrases
Phrase 1 no 3rds
Phrase 4 no 3rds
Phrase 5 no 3rds
150
149
148
147
146
145
144
Frequencies
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Takes

AVC_BBC_Reference Frequencies_Phrases
Phrase 1 with 3rds
Phrase 4 with 3rds
Phrase 5 with 3rds
150
149
148
147
146
145
144
Frequencies
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Takes




AVC_BBC_Reference Frequencies_Phrases 2 and 3
Phrase 2
no 3rds
Phrase 3
no 3rds
113
112
111
110
109
108
107
Frequencies
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Takes


AVC_BBC_Reference Frequencies_Phrases 2 and 3
Phrase 2
with 3rds
Phrase 3
with 3rds
113
112
111
110
109
108
107
Frequencies
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Takes

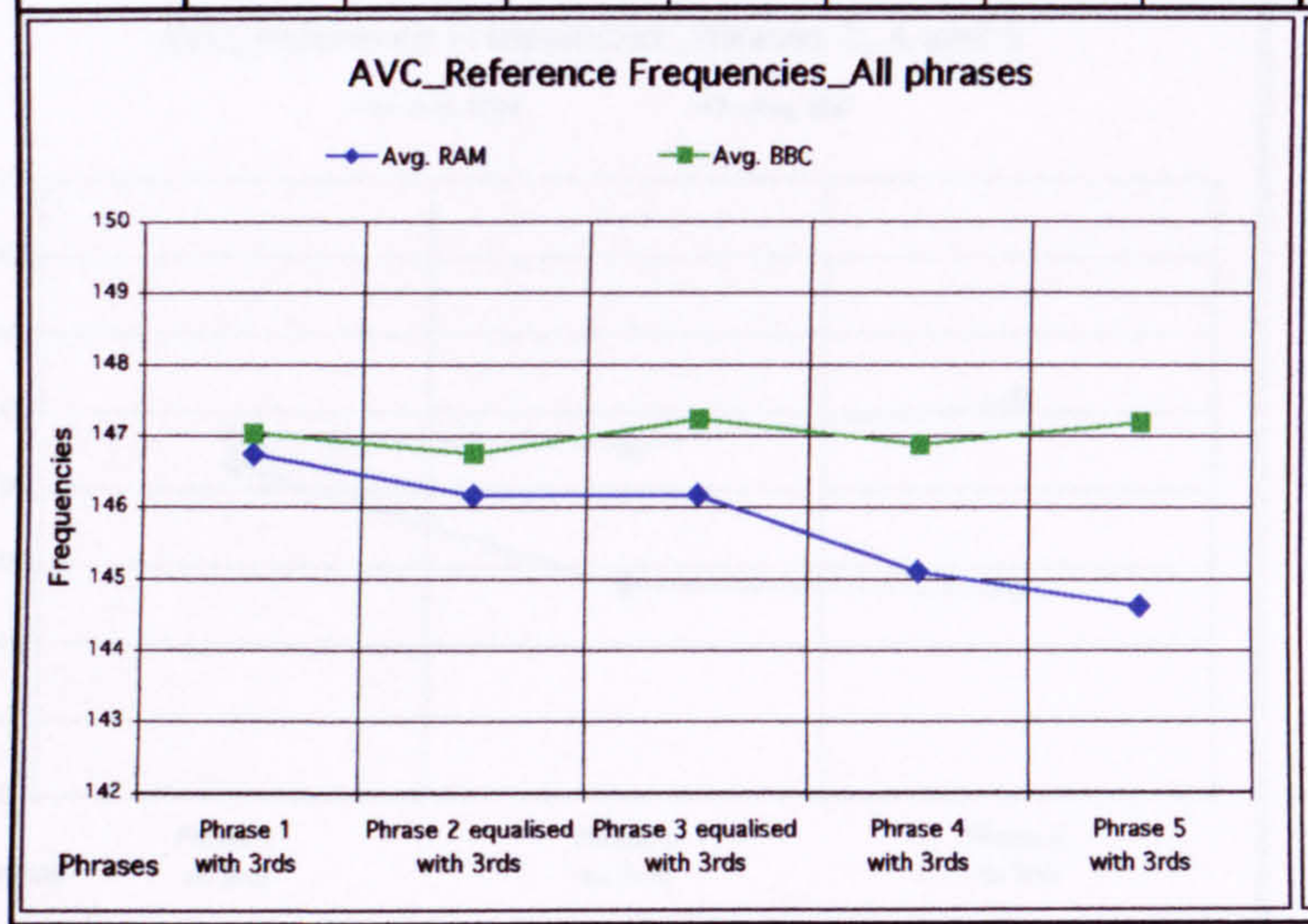
APPENDIX 12

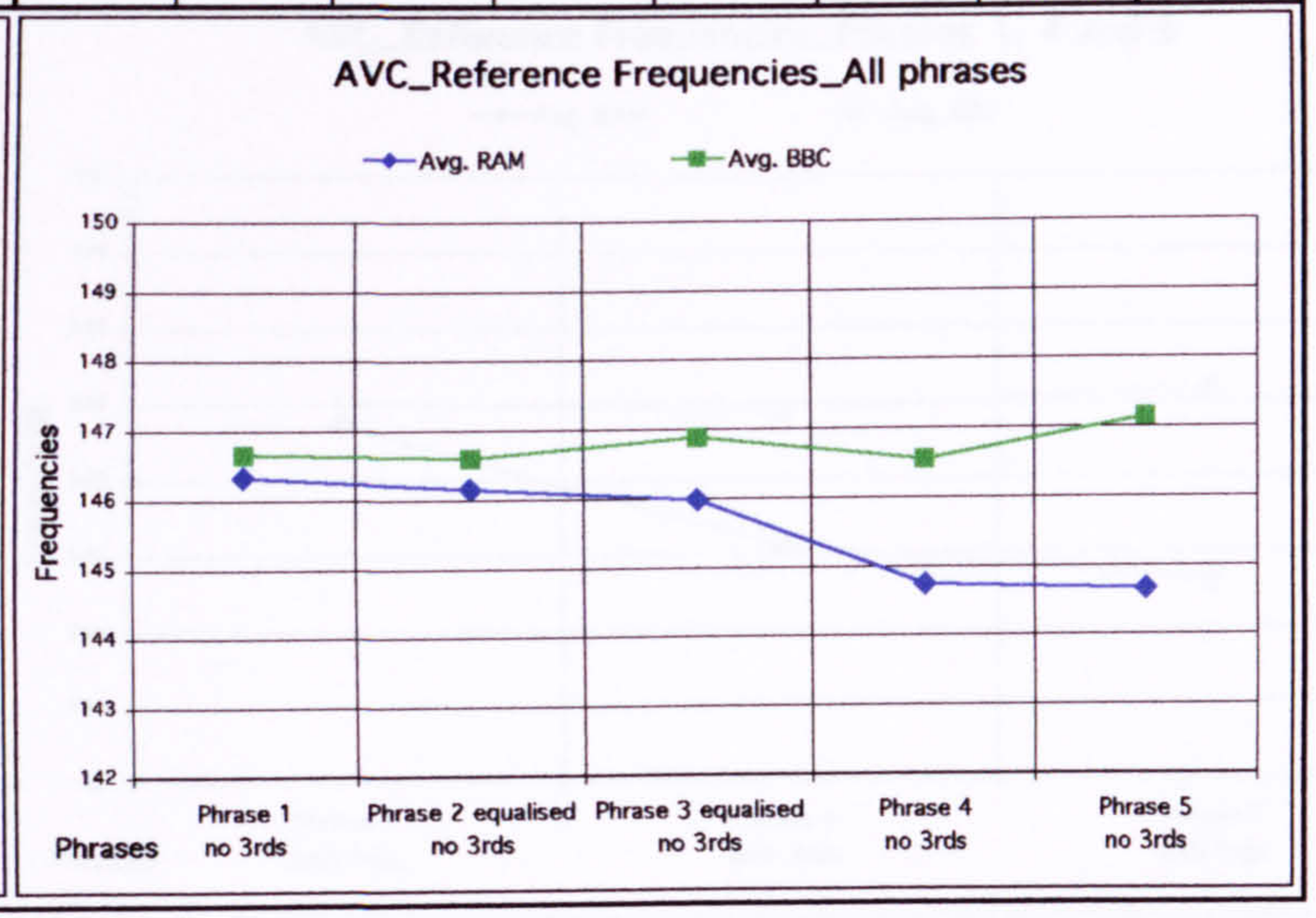
12 - MEASUREMENTS RESULTS
– REFERENCE FREQUENCIES GENERAL AVERAGES –

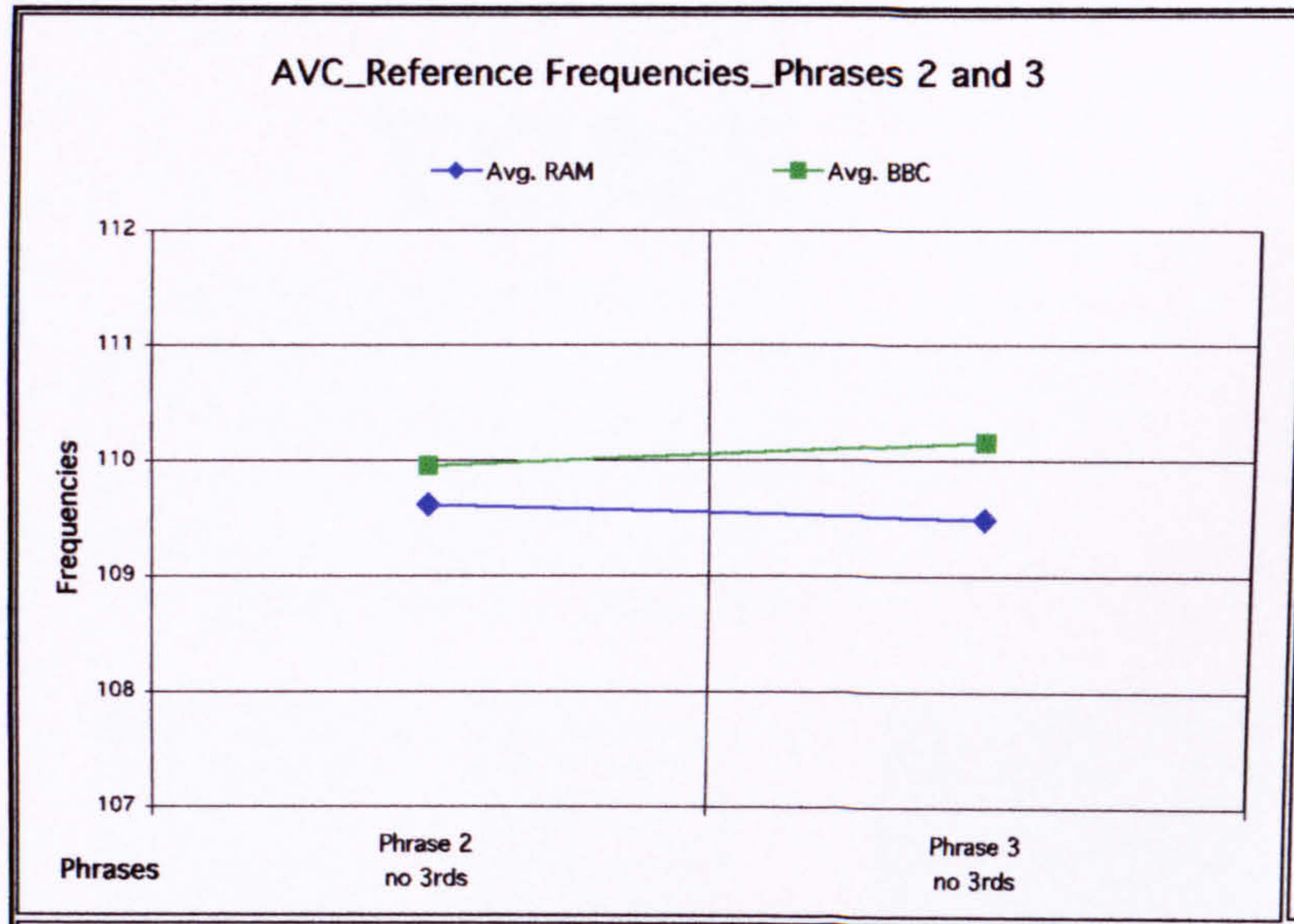
12 – REFERENCE FREQUENCIES GENERAL AVERAGES' RESULTS

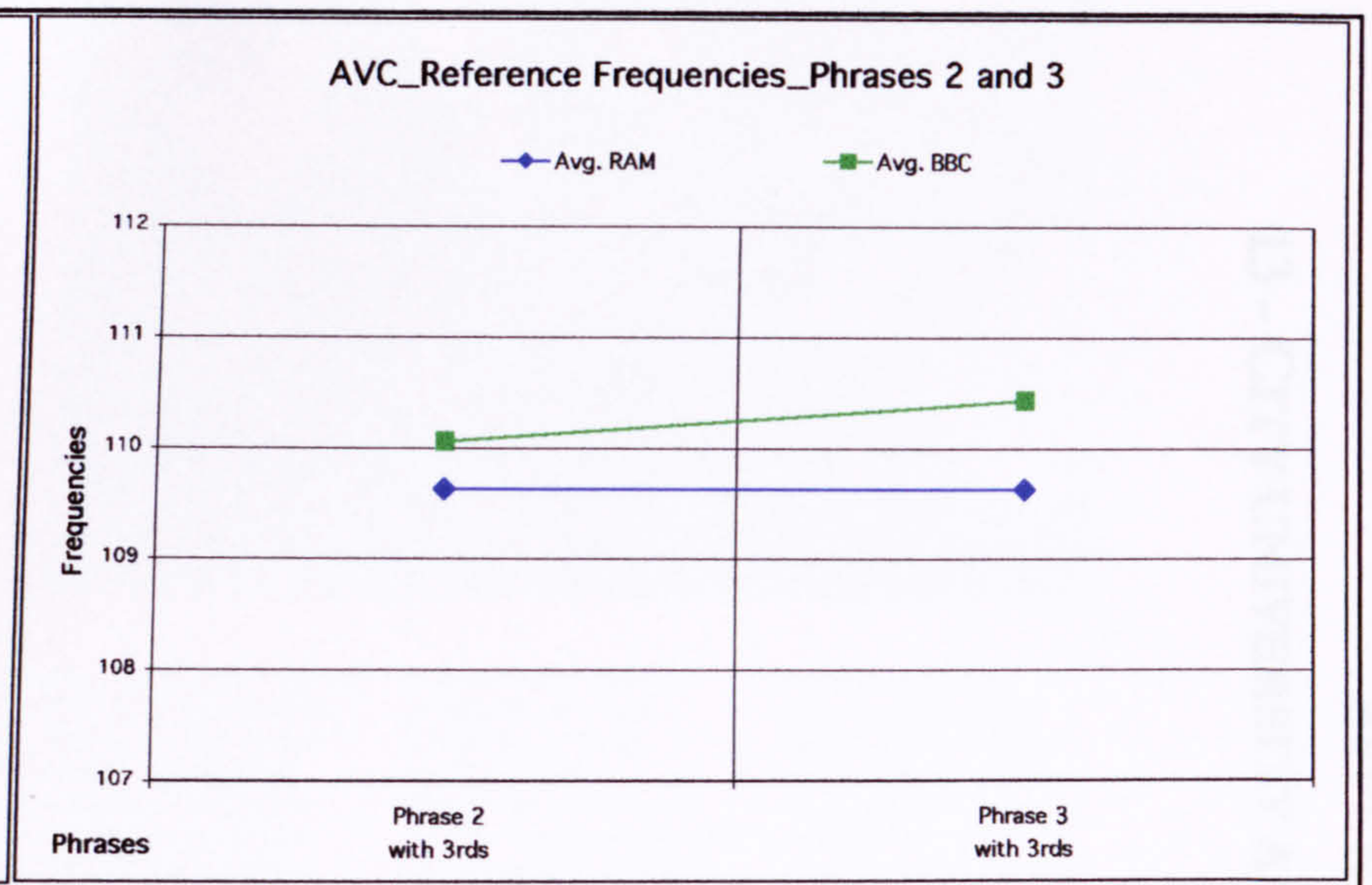
AVC _ Reference Frequencies _ General Averages

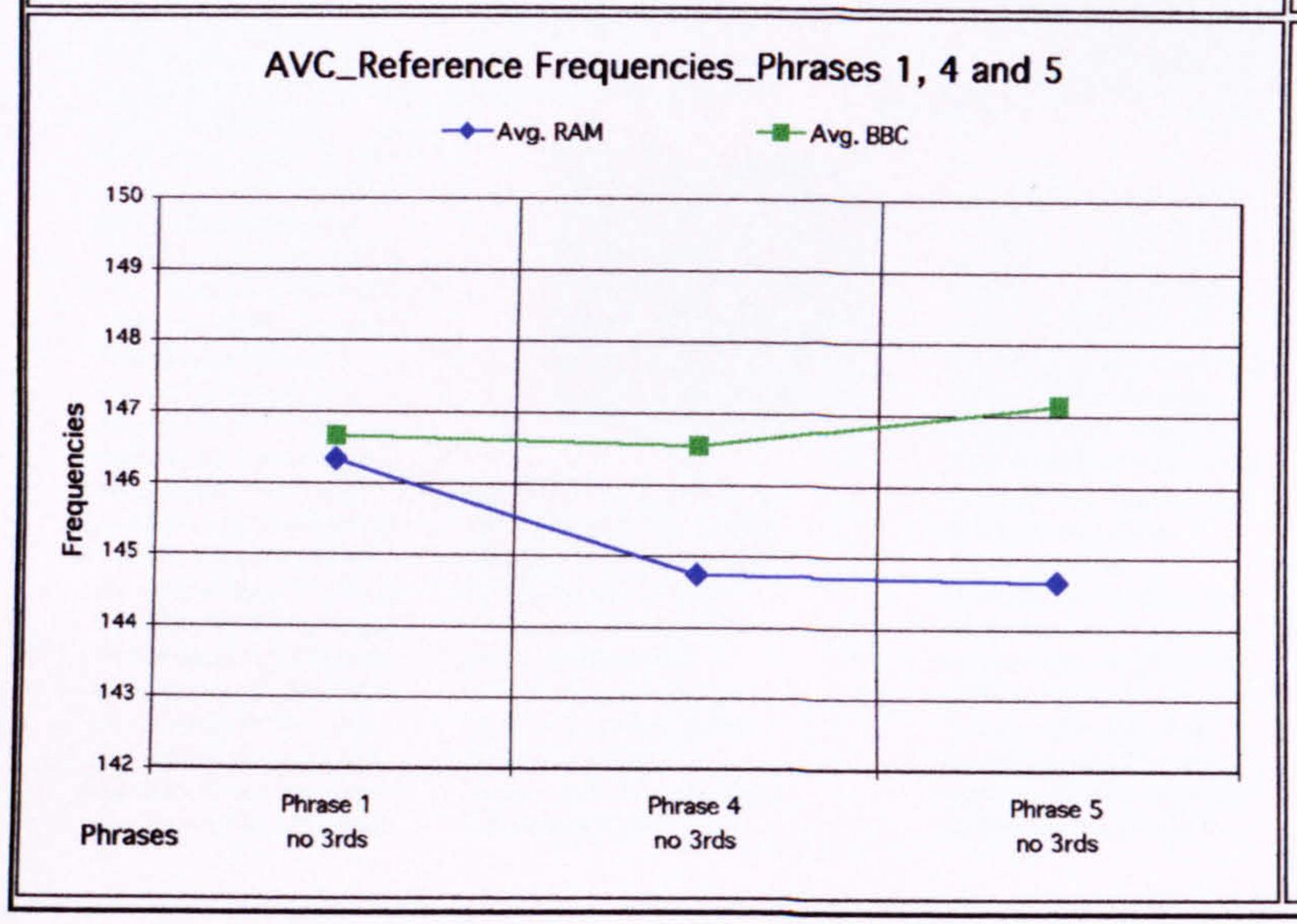
	Phrase 1 with 3rds	Phrase 2 with 3rds	Phrase 3 with 3rds	Phrase 2 equalised with 3rds	Phrase 3 equalised with 3rds	Phrase 4 with 3rds	Phrase 5 with 3rds	Phrase 1 no 3rds	Phrase 2 no 3rds	Phrase 3 no 3rds	Phrase 2 equalised no 3rds	Phrase 3 equalised no 3rds	Phrase 4 no 3rds	Phrase 5 no 3rds	
Avg. RAM	146.740	109.624	109.628	146.166	146.170	145.099	144.617	146.326	109.612	109.482	146.150	145.977	144.736	144.660	**Avg. RAM**
Avg. BBC	147.030	110.057	110.428	146.743	147.238	146.875	147.179	146.658	109.949	110.156	146.599	146.875	146.543	147.138	**Avg. BBC**
Differences	RAM Ph1-ph2: - 7 cents Ph2-ph3: irrellevant Ph1-ph4: - 20 cents Ph1-ph5: - 25 cents BBC Ph1-ph2: - 3 cents Ph2-ph3: + 6 cents Ph1-ph4: - 2 cents Ph1-ph5: + 1 cent							RAM Ph1-ph2: -2 cents Ph2-ph3: - 2 cents Ph1-ph4: - 19 cents Ph1-ph5: - 20 cents BBC Ph1-ph2: - 1 cent Ph2-ph3: + 3 cents Ph1-ph4: - 1 cent Ph1-ph5: + 5 cents							**Differences**
Averages	146.885	109.841	110.028	146.455	146.704	145.987	145.898	146.492	109.781	109.819	146.374	146.426	145.640	145.899	**Averages**

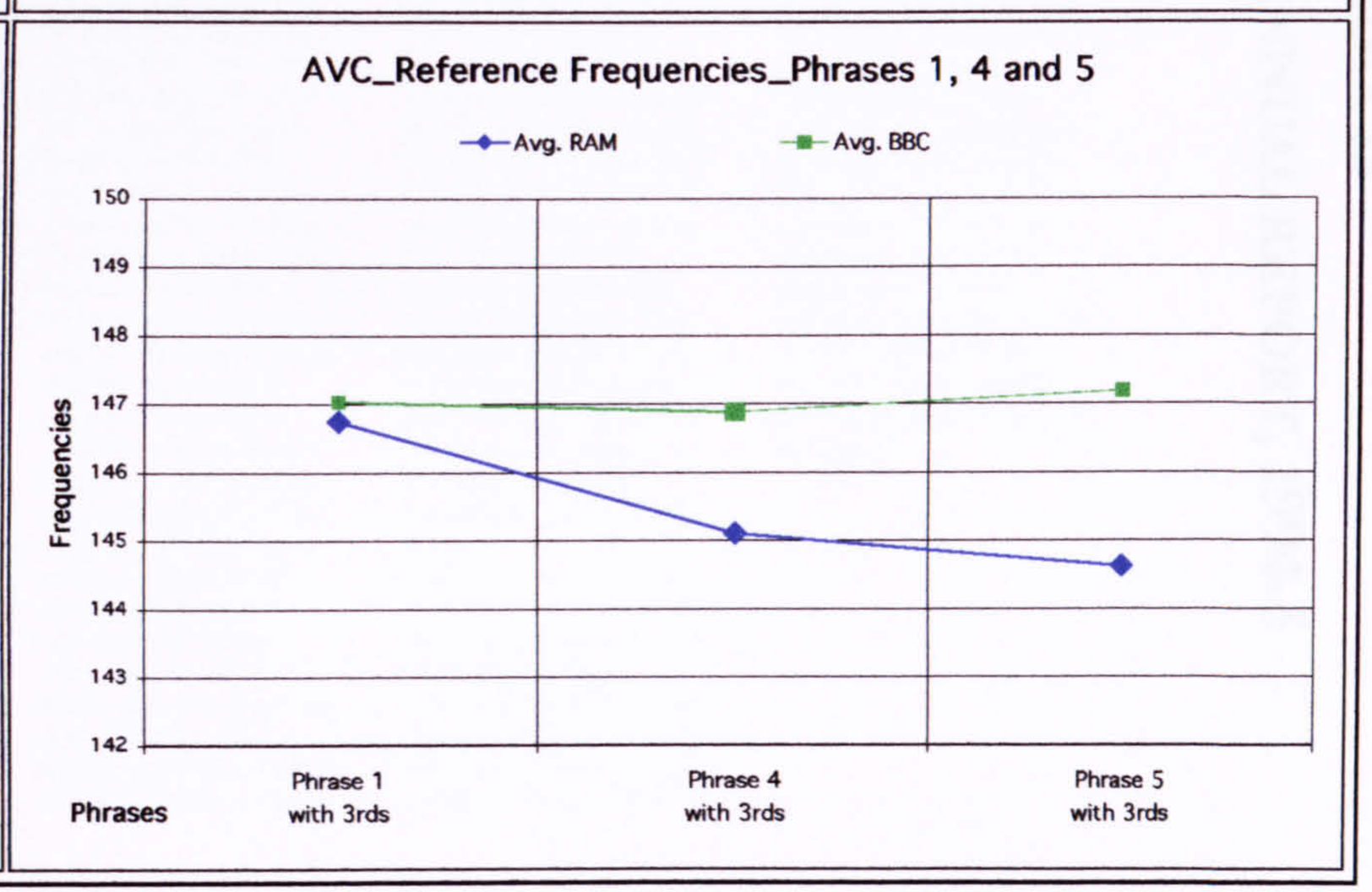





AVC_Reference Frequencies_Phrases 2 and 3
Avg. RAM
Avg. BBC
112
111
110
109
108
107
Frequencies
Phrase 2
no 3rds
Phrase 3
no 3rds
Phrases


AVC_Reference Frequencies_Phrases 2 and 3
Avg. RAM
Avg. BBC
112
111
110
109
108
107
Frequencies
Phrase 2
with 3rds
Phrase 3
with 3rds
Phrases


AVC_Reference Frequencies_Phrases 1, 4 and 5
Avg. RAM
Avg. BBC
150
149
148
147
146
145
144
143
142
Frequencies
Phrase 1
no 3rds
Phrase 4
no 3rds
Phrase 5
no 3rds
Phrases


AVC_Reference Frequencies_Phrases 1, 4 and 5
Avg. RAM
Avg. BBC
150
149
148
147
146
145
144
143
142
Frequencies
Phrase 1
with 3rds
Phrase 4
with 3rds
Phrase 5
with 3rds
Phrases

12 - REFERENCE FREQUENCIES GENERAL AVERAGES

APPENDIX 13
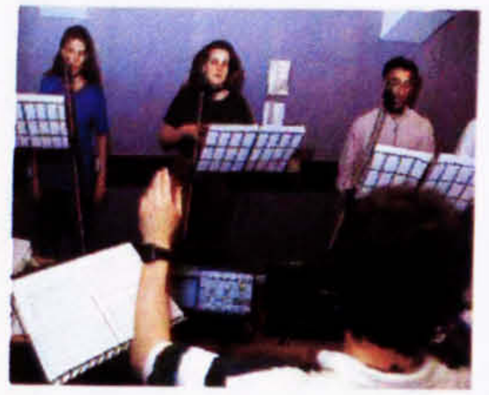
13 - CITY UNIVERSITY ANNUAL REPORT, 1994-5

Setting the **TONE**

New **digital technology** has made it possible for the first time to analyse minute variations in **intonation of choral singers** in performance and could shed new light on **performance practice.**



There is already an established body of research on intonation or 'tuning' in singers' voices, but this has focused on individual singers and has taken place in a studio or laboratory situation. This necessarily focuses on melody, rather than harmony, and does not tell us anything about the intonational behaviour of choral singers in a performance situation.
Research student Jocelei Bohrer became interested in this area when working as a conductor. Using conventional recording technology, however, it has not been possible to isolate and analyse the frequencies of an individual singer within a group as the microphone picks up frequencies from the other singers. Thus it has not been possible to analyse how groups of singers tune their voices to one anothers' when singing in harmony.
Intonation has always been important in musical practice throughout Western musical history. The pitches of musical notes, like any sound, are measured in frequencies - the greater the frequency, the higher the note. When notes sound together, the vibrations produce complex, harmonic frequencies. The difference between the frequencies can





also cause a 'beat' which may sound dissonant. The melodic difference in frequency between notes in a scale - the interval - is determined by the tuning system.
Around 200 years ago, an Equal Temperament tuning system was adopted in Western music. This prescribes uniform distances between each semi-tone of the scale and addresses many of the problems of 'beating' and limitations in adaptability to different keys which had been a feature of earlier tuning systems. While this system eliminates major problems, it still contains small errors in all its intervals, and all 'beat' to some extent when sounded together.
Mr Bohrer noticed that in a performance situation, when singing certain combinations of notes, the actual note sung by each voice might vary slightly from that of a fixed intonation instrument such as the piano, erring towards a more 'natural' harmonic system to avoid the dissonance of 'beating'. Mr Bohrer is now working with Dr Simon Emmerson from the Music Department and Mr Allen Hirson in the Department of Clinical Communication Studies using a specialist piece of equipment called the laryngograph to study how this happens. The laryngograph is used by speech clinicians to measure the vibrations in the larynx. By attaching a pair of electrodes from the laryngograph to the throat of each member of a quartet of singers, it is possible to record very accurately the frequencies each singer is producing at a given time. This data is then analysed using SoundScope software and spectrography in the Department of Clinical Communications Studies to display the music graphically as well as to provide numerical analysis. Because the laryngograph technology is so accurate, variations in intonation of a 'cent' - a 100th of a semi-tone, can be identified.
Mozart's *Ave Verum Corpus* has been chosen as the music for the experiments because it is a good example of classical harmonic writing, comprising regular, sustained notes and phrases in all the voice parts. This will enable analysis of each individual note and chord, comparing them to the expected frequencies calculated for a range of historical tuning systems. It will also enable an assessment of phrases to see if there are intonational trends across a phrase.
The first in a series of experiments has involved a group of students from the Music Department. Further experiments will be conducted with other groups of singers to identify mistakes in intonation and to characterise intentional deviation from the equal temperament tuning system. Mr Bohrer hopes to be able to conduct the experiment with an established professional quartet to assess whether results are more consistent where a group is accustomed to singing together. Because the laryngograph is a specialist piece of equipment, it is not readily available in large numbers - Laryngograph Ltd., the London-based manufacturers kindly supported the experiment. This means that the same analysis of larger groups is not currently possible. It is hoped however, that this method of analysis will help pave the way for much larger experiments in the future.

APPENDIX 14

14 - SOUND EXAMPLES—ACOUSTIC CD

1. Harmonics
2. *Ave Verum Corpus* – equal temperament
3. *Ave Verum Corpus* – Pythagorean intonation
4. *Ave Verum Corpus* – meantone temperament
5. *Ave Verum Corpus* – just intonation I
6. *Ave Verum Corpus* – just intonation II
7. *Ave Verum Corpus* – first phrase, Pythagorean intonation
8. *Ave Verum Corpus* – first phrase, meantone temperament
9. *Ave Verum Corpus* – first phrase, equal temperament
10. *Ave Verum Corpus* – first phrase, pure intonation
11. *Ave Verum Corpus* – second phrase, Pythagorean intonation
12. *Ave Verum Corpus* – second phrase, meantone temperament
13. *Ave Verum Corpus* – second phrase, equal temperament
14. *Ave Verum Corpus* – second phrase, pure intonation I
15. *Ave Verum Corpus* – second phrase, pure intonation II
16. *Ave Verum Corpus* – third phrase, Pythagorean intonation
17. *Ave Verum Corpus* – third phrase, meantone temperament
18. *Ave Verum Corpus* – third phrase, equal temperament
19. *Ave Verum Corpus* – third phrase, pure intonation I
20. *Ave Verum Corpus* – third phrase, pure intonation II
21. *Ave Verum Corpus* – fourth phrase, Pythagorean intonation
22. *Ave Verum Corpus* – fourth phrase, meantone temperament
23. *Ave Verum Corpus* – fourth phrase, equal temperament
24. *Ave Verum Corpus* – fourth phrase, pure intonation
25. *Ave Verum Corpus* – fifth phrase, Pythagorean intonation
26. *Ave Verum Corpus* – fifth phrase, meantone temperament
27. *Ave Verum Corpus* – fifth phrase, equal temperament
28. *Ave Verum Corpus* – fifth phrase, pure intonation
29. Royal Academy of Music singing quartet's acoustic signal
30. Royal Academy of Music singing quartet's larinx excitation signal
31. The BBC Singers' acoustic signal
32. The BBC Singers' larinx excitation signal
33. Royal Academy of Music singing quartet's replication – first phrase
34. Royal Academy of Music singing quartet's replication – second phrase
35. Royal Academy of Music singing quartet's replication – third phrase
36. Royal Academy of Music singing quartet's replication – fourth phrase
37. Royal Academy of Music singing quartet's replication – fifth phrase
38. The BBC Singers sections' replications – first phrase
39. The BBC Singers sections' replications – second phrase
40. The BBC Singers sections' replications – third phrase
41. The BBC Singers sections' replications – fourth phrase
42. The BBC Singers sections' replications – fifth phrase
43. The BBC Singers sopranos' replications – first phrase
44. The BBC Singers sopranos' replications – second phrase
45. The BBC Singers sopranos' replications – third phrase
46. The BBC Singers sopranos' replications – fourth phrase

47. The BBC Singers sopranos' replications – fifth phrase
48. The BBC Singers altos' replications – first phrase
49. The BBC Singers altos' replications – second phrase
50. The BBC Singers altos' replications – third phrase
51. The BBC Singers altos' replications – fourth phrase
52. The BBC Singers altos' replications – fifth phrase
53. The BBC Singers tenors' replications – first phrase
54. The BBC Singers tenors' replications – second phrase
55. The BBC Singers tenors' replications – third phrase
56. The BBC Singers tenors' replications – fourth phrase
57. The BBC Singers tenors' replications – fifth phrase
58. The BBC Singers basses' replications – first phrase
59. The BBC Singers basses' replications – second phrase
60. The BBC Singers basses' replications – third phrase
61. The BBC Singers basses' replications – fourth phrase
62. The BBC Singers basses' replications – fifth phrase
63. The BBC Singers' replications (all individual singers) – first phrase
64. The BBC Singers' replications (all individual singers) – second phrase
65. The BBC Singers' replications (all individual singers) – third phrase
66. The BBC Singers' replications (all individual singers) – fourth phrase
67. The BBC Singers' replications (all individual singers) – fifth phrase

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